THE MARINE REVIEW

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Training Genius to be Accurate

Is the Shipbuilding Industry Taking the Fullest Advantage of the Present Opportunity to Develop Improved Methods?—What One Newcomer Found in His Shop

YOUR natural interest in building up the productive capacity of your plant—whether expressed in terms of minutes saved on one particular job, or weeks saved in the delivery of the completed vessel—will cause you to appreciate and possibly profit from the following story told a few days ago by a man high in the councils of a big shipbuilding company.

"When the present owners bought out the control of this yard, not so very many months ago, none of the present officials knew anything about shipbuilding. We knew the distinction between the bow and the stern and the position a keel should occupy, but in a broad way that was about all. But we did know a few of the rudiments of good manufacturing practice and for that reason we attacked our new work with more or less confidence.

The Need for an Experimental Bureau

"One of the first things we did was to organize a department to carry on experiments. This department concerned itself not with the theoretical problems of ship design or construction, but with the rather commonplace questions of yard practice—for instance, making two rivets grow where only one had been in evidence.

"Take this riveting problem merely as an illustration. Newcomers in the field as we were, we were rather dubious of our ability to discover any departures from the practice of some older yards that would enable us to drive more rivets per man per hour than any one else had been doing.

"We looked for some data on the number of rivets a 'gun' should drive before breaking. We sought information on the causes of breakage, whether crystallization, faulty manufacture, or what. Such data may exist, but we couldn't obtain it. We heard of some guns driving 300 rivets. Then we heard of 10,000. One manufacturer guaranteed 20,000. One thing that impressed us was that one 'gun' might fit the rivet head perfectly, while another tool of the same type would prove a little too large or too small.

"When we turned our attention to the pneumatic 'gun', we also found evidences of the need of more clearly defined standardization. The net result was that we designed rivet sets for our own use and made the rule that the 'guns' must conform to that standard. When the rivet sets were completed, I gave them to our foreman. He was enthusiastic over the idea and decided to try it at once. He secured a 'gun' from the stockroom—and the sets wouldn't fit. We tried a second one and it fit perfectly. Yet both tools were part of an order for 50 secured from the same manufacturer.

"We are turning our attention to a number of similar problems in shop practice. I don't want to give the idea that we newcomers think we are or can revolutionize the shipbuilding industry. My point is simply that American industry as a whole must learn to be more accurate. If that is true in peace times, it is tremendously important now."

What is Wrong With Our Methods

The narrator obviously was not directing any attack at the rivet or the pneumatic hammer industries. His remarks are a paraphrase of what almost any newcomer might utter after a few months' experience in a strange industry. The remarks are directed not at the shipbuilding industry, but at American methods as a whole.

The stories of losses through high rejections on munition contracts; of inability to build motors that our allies have been making in quantity; all these point to the need of training American genius to place due emphasis on the essential feature of manufacturing accuracy. To the shipbuilding industry, now for the first time rushed to capacity and financially strong enough to experiment with and develop the economies learned from mass production, the experiences of this newcomer should prove an incentive to still greater efforts to put our yards on the highest plane of efficiency.

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New Shipping Board Begins to Act

Rear Admiral Capps Commandeers Ships Under Construction—E. N. Hurley Has Had Successful Career—Capps Rebuilt Our Navy—One of Original Board Remains

THE settlement of the differences between Major General Goethals and William Denman has been followed by definite action on the part of the new officers in commandeering vessels now under construction for foreign account. Definite action, however, has not been taken on the other Goethals project of building two mammoth government yards, but a decision one way or the other is expected shortly.

The removal of both of the principals in the row which for days effectually retarded the work of carrying on the government's plans for building a great number of steel and wooden vessels, has brought about harmony in the relations between the shipping board, of which Denman was chairman, and the emergency fleet corporation of which Denman was president and Goethals, general manager. Both Edward N. Hurley, who succeeded Denman, and Rear Admiral Capps, who succeeded Goethals, took office under the announced intention of working toward the one aim of getting as many ships as possible built in the quickest time possible.

The resignation of General Goethals and the practical removal of Mr. Denman cannot be taken as a victory for either the steel or the wooden ship advocates. While the general was popularly supposed to be opposed to the wooden ship plans, and Mr. Denman favored them, the question in dispute between the two men was basically one of the proper division of authority. General Goethals, as shown by figures given out a few days before his resignation, had actually ordered 425 ships, of which 348 were wood. He was negotiating for 100 additional wooden ships. The 348 wooden ships have a tonnage capacity of 1,218,000 tons, and will cost $174,000,000. The 77 steel ships ordered have a tonnage capacity of 642,800 tons and will cost $101,660,356. Together, the 425 ships will have a tonnage capacity of 1,860,800 tons and will cost $275,000,000. General Goethals planned two government yards where 400 ships of an aggregate tonnage capacity of 2,500,000 tons could be built within 18 to 24 months. Plans for these yards had all been drawn.

Admiral Capps a few days ago told a group of lumbermen that "the merits of wood or steel have nothing whatever to do with the case. The output of both classes is vitally important to the situation".

The tonnage commandeered by the emergency fleet corporation, on orders from Admiral Capps, include all power-driven, cargo-carrying and passenger vessels above 2500 tons deadweight capacity under construction. The government intends to expedite the construction of these ships, and to do so may be called upon to supply labor sufficient to insure continuous operation of the yard. The yards are instructed not to enter into any additional contracts or commitments without the express authority of the corporation.

EDWARD N. HURLEY
His Friends Believe His Selection as Shipping Board Chairman Will Do Much to Build Up Our Merchant Marine

Edward N. Hurley, the new chairman of the shipping board, is a former shipbuilder. His appointment has met with the approval of those familiar with Mr. Hurley's abilities and his record in the discharge of governmental duties in other fields. He had had a successful career in business before accepting an appointment to the federal trade commission. A few months later he became chairman of the commission and during his tenure of office pushed through much of the work which that body has so far been able to accomplish. He resigned to re-enter private business, but was called back to Washington within a few weeks to help reorganize the Red Cross. Later President Wilson appointed him to the exports council.

Rear Admiral Washington Lee Capps, chief constructor of the navy, has had a long experience in shipbuilding. He has been a close student of the science of naval construction and is well versed in every phase of the practical work of getting vessels built.

Admiral Capps was born at Portsmouth, Va., Jan. 31, 1864. He graduated at the United States naval academy in 1884 and served on the Tennessee from 1884 to 1886; was promoted to ensign in 1886 and appointed assistant naval constructor June 6, 1888. He attended the University of Glasgow, Scotland, and graduated with the degree of bachelor of science in 1889. On his return to the United States, he began his active work in naval construction. He was assigned to duty at Cramp's shipyard in 1889 and from 1889 to 1892 was on duty at the New York navy yard. From 1892 to 1895 he was on duty at the bureau of construction and repair, and from 1896 to 1898 superintended construction for the navy at the Union Iron Works. During the Spanish-American war, 1898-9, he was on special duty on the staff of Admiral Dewey, commander-in-chief of the Asiatic station. From 1899 to 1901 he was a member of the board of inspection and survey, Washington, and from that time until 1903 was head of the construction department of the New York navy yard.

On Oct. 31, 1903, he was appointed chief of the bureau of construction and repair, with the rank of rear admiral, and was reappointed in 1907. He resigned Oct. 1, 1910, and was given a permanent commission as chief constructor with the rank of rear admiral from that date, in accordance with an act of congress approved June 24, 1910.

After his resignation as chief of the bureau, he was made senior member of the board on hull changes, Atlantic coast. He was sent to Manila to inspect and report upon the facilities of the naval station at Cavite and Olongapo. On his return, via Suez, to the United States he visited the principal dockyards and shipbuilding plants in Europe.

He was appointed by President Wilson a commissioner to represent the United States at the international

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maritime conference in London, in 1913, and was chairman of the committee on safety of construction. He was delegate representing the navy department at the international engineering conference at San Francisco in September, 1915, and was chairman of the section on naval architecture and marine engineering.

At the time of his designation as General Goethals' successor, Admiral Capps was president of the board on

REAR ADMIRAL W. L. CAPPS
In Charge of Merchant Ship Construction. He Designed and Built Most of the Ships of Our Present Battleship Fleet. This is a New Photograph

hull changes on vessels building for the navy on the Atlantic coast, senior member of the naval compensation board and a member of the navy yards commission. He is a member of numerous scientific societies in the United States and abroad. In 1912 the University of Glasgow conferred upon him the honorary degree of doctor of science.

Speaking of Admiral Capps' selection, Secretary Daniels said: "Admiral Capps was for many years chief constructor of the navy, and his record of achievement in that position is of the best. He is thoroughly known and appreciated by the shipbuilding interests of the country, although perhaps not so well known to the general public, as he is not an advertiser. He served as chief constructor from November, 1903, to October, 1910. During this time the tonnage of the navy was more than doubled and the majority of the present fighting vessels of the navy were designed by him."

John B. White, Kansas City, who resigned a few days before the Goethals-Denman row was settled, left the board owing to poor health. President Wilson appointed Bainbridge Colby as his successor. He is a successful lawyer from New York City, and has been active in politics as a Progressive.

Theodore Brent, vice chairman of the board and a strong supporter of Mr. Denman, handed his resignation to President Wilson a few days after Mr. Denman resigned. But one of the original appointees remains, John A. Donald, former president of the Donald Steamship Co. The fifth member, Raymond B. Stevens, succeeded Bernard M. Baker, who resigned while the board was organizing, owing to the administration's determination to make Mr. Denman chairman.

Approves Appraisal of Whaleback

Judge Geiger, of the federal court at Milwaukee, has approved the appraisal of the whaleback CHRISTOPHER COLUMBUS at $160,000 after the accident of June 30, and the fixing of the passage money at $255.87, as made by William J. Wood, Chicago; Edward Gaskin, Buffalo, and Carl C. Joys, Milwaukee. Confirmation is made without prejudice to the right of claimants hereafter appearing, and the Goodrich Transit Co. is required to give a stipulation with sufficient sureties in the sum of $160,255.78 and payment to the court when ordered. The next step in connection with the company's petition for limitation of liability probably will be the issuance of a monition requiring all persons interested to appear before a commissioner and make proof of their claims.

The new steamer PORTIERS built by the Superior Shipbuilding Co. for French owners, was given a trial trip July 19, and the following day left for Montreal to load for France.

The Detroit & Cleveland Navigation Co. found it necessary to put two additional boats on the route between Cleveland and Detroit, Monday, July 2. Increasing passenger and freight business on the Cleveland division is the cause of the change, which gives a daily service of three boats each way between the two cities. This is the largest number of boats ever used regularly on the run. Under the new schedule the steamers CITY OF DETROIT II and CITY OF ST. IGNACE will alternate between Detroit and Cleveland, leaving Detroit at 8:30 a. m. and 11 p. m. standard

REAR ADMIRAL DAVID W. TAYLOR
In Charge of Naval Construction. His Paper on "The Science of Naval Architecture" Was Published in THE MARINE REVIEW Last Month

time. The steamer EASTERN STATES went back on the route July 2.

The former German steamship OCKENFELS, seized at Boston, has been repaired and sailed in command of Capt. F. R. Hunt, Dorchester, Mass.

W. B. McAllister, for 20 years connected with the Allan line at Boston in the freight and passenger service, has become associated with Furness, Withy & Co., Ltd., in their Boston office.

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Barges to Revive River Traffic

New Scheme to Rehabilitate Mississippi Waterway Appears to Have Strong Backing—Plan to Build Fifty 1500-Ton Barges

A CENTRAL organization of all the river traffic development societies has been formed at St. Louis, to be known as the Mississippi Valley Waterways association, with James E. Smith as president, and with branches in New Orleans, Kansas City, Mo., Burlington, Peoria, Cincinnati, Little Rock, Minneapolis and Memphis. The object of this association is to correlate and direct the activities of all river organizations, on both sides of the Mississippi, from the Twin Cities to the Gulf of Mexico, to the end that traffic may be restored on a large scale to the Father of Waters and all his tributaries.

Two barge corporations, with aggregate capital stock of $3,500,000, one operating on the Mississippi river and its tributaries north of St. Louis, and the other in the same manner to the south of the Missouri city, were authorized at the river conference in St. Louis, May 8 and 9.

Headquarters of the association were established in St. Louis and the executive offices of the two corporations located here. Vice presidents, to be in charge of the various branches, were named as follows: M. J. Sanders, New Orleans; Thomas Wilkinson, Burlington, Iowa; W. T. Bland, Kansas City, Mo.; B. L. Sommers, Peoria, Ill.; Albert Bettinger, Cincinnati; Governor Charles H. Brought, Little Rock, Ark.; B. L. Mallory, Memphis, and W. F. Decker, Minneapolis.

Representatives of 35 valley cities attended the meeting, and one man from each was named a director in the new corporations, either to the north or the south, according to the position occupied by his home town.

First concrete results of the organization of the Mississippi Valley Waterways association was the subscription by the New Orleans board of trade of $25,000 in stock in the new double corporation. The allotment of stock to New Orleans was $750,000, and committee of the board of trade, association of commerce and kindred organizations are now canvassing shipping and commercial circles for stock subscriptions, which are said to be coming in rapidly. It is estimated that $20,000 a year will cover the administration expenses of the association, but that more than $2,500,000 will be required to put the two corporations in working condition, and carry them until the income meets the expenses. It was agreed at the conference that neither barge company is to start business until its entire capital has been subscribed.

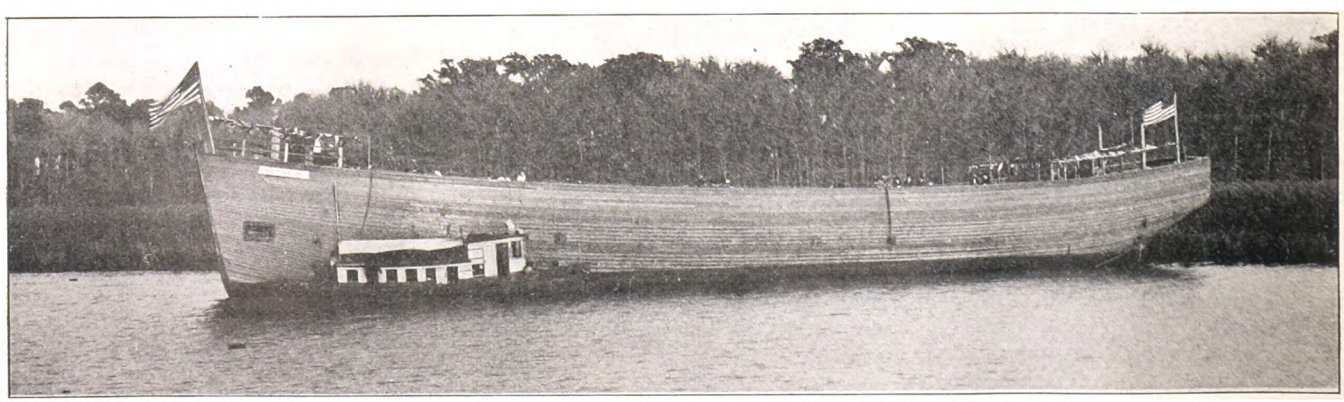
Stock is Subscribed

Minneapolis and St. Paul merchants, shippers and business men announced their readiness to subscribe for $2,000,000 worth of stock, but it is not probable that they will be allowed to take that much, owing to demand from the other cities in the association. Distribution of stock in proportion to traffic needs of each city is the plan proposed. The Minnesota subscription comes mainly from the flour interests to which the barge lines proposed would offer great relief from shortage of freight cars and high railroad rates. New Orleans subscriptions, at the other end of the long waterway, are coming for the most part from coffee and tropical fruit importers and the lumber interests, who, like the flour men, have suffered greatly from scarcity of cars and from high freight rates.

The plan of the corporations, as formulated at St. Louis and ratified by the trade organizations of the various cities party to the Mississippi Valley association, is to build 50 barges, either of wood or steel, material not yet determined, and seven tugs or towboats, the barges to be about 1500 tons capacity each. Calls by these trains of barges are to be made at each river port in the association at least twice a week, and it is estimated that the 50 barges will be sufficient to carry all the traffic promised for the first year, when other units of seven barges and towboat can be added as needed. It is also estimated the enterprise will be self-supporting by the end of the first 12 months.

In line with this project, the advisory council of five railroad presidents, of which Fairfax Harrison, of the Southern railway, is the chairman, has been urged by commercial interests of the valley to make restoration of traffic to the rivers of the valley a war measure, and to utilize all present or future barge and steamer facilities for this purpose. Proponents of the barge line say they have reason to believe that mobilization of all river transportation facilities will result from the action at St. Louis and from steps to be taken by the railroad chiefs in the advisory council.

There seems, as a matter of fact, to be little opposition from the railroads to the barge line plan, largely for the reason that there is no hope of the railroads relieving the congestion of freight at many Mississippi valley and



HULL OF BARGE GEORGE T. LOCK IMMEDIATELY AFTER LAUNCHING

This vessel was built at the yard of the Clooney Towing & Construction Co., Lake Charles, La. The new barges to be used on the Mississippi river, if constructed of wood, are to be of this type, but if built of steel, they will be lower and slightly longer.

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Gulf coast points. One of the great needs of this barge line is river terminals at the ports at which it will touch, and Walter Parker, of New Orleans, lately named chief of the federal inland waterways under the department of commerce, and L. M. Nicolson, manager of the joint traffic bureau of the association of commerce of New Orleans, went to St. Louis early in July for a conference with river transportation authorities and the heads of the new association in regard to these terminals. Conferences with Minneapolis and Cincinnati authorities on the same subjects are being arranged.

Commerce is Hampered

While in New Orleans, Mr. Parker, who was formerly general manager of the association of commerce there, spoke at some length on the work of the department of commerce in the revival of traffic on the nation's inland waterways. In part he said:

"Just now the commerce of the United States is handicapped by inadequate means of transportation. The railroads are doing the best they can under existing circumstances. They are probably delivering 100 per cent of the service possible with the equipment they have. The country needs still greater service, and cannot hope to get it from the railroads because during several years past the growth and expansion of the railroads have not kept pace with the needs of the country, and no adequate relief in this direction seems possible now.

"Europe, with her dense population, has never experienced such traffic congestion as the United States is experiencing and will probably continue to experience, because Europe has never abandoned her waterways as freight carriers.

"Even now, in the midst of war, France is completing a great navigation canal which will link the Mediterranean with the Atlantic, and reduce transportation costs over an extensive area.

"Since there are not enough freight cars to supply all the shippers clamoring for them, and since the need for cars will probably continue to increase more rapidly than the supply, those communities and sections which can use boat lines will be shortsighted indeed if they do not make every effort to do so.

"There are many boats and barges on our navigable waterways which are not now being used. Some of them are in condition to be used, provided the towns to be served see to it that existing physical handicaps incident to the transfer of freight to and from the boats be removed.

Transfer Equipment is Economical

"In most cases a wharf boat or a simple landing, and an automobile truck will serve. In any case, practical equipment can be provided at far less cost to a community than is the cost to that community of car shortage and terminal congestion at the ports.

"As the water-borne commerce develops, forced by the existing emergency, a more economic type of boat and barge and a more efficient system of local terminal equipment will come.

"Best of all, shippers will get into the habit of using the boat lines, just as the European shippers do, and they will discover that in some directions at least boat lines possess distinct advantages and that they can be used with profit.

"Boats do not have to be sidetracked to permit other boats to pass. Freight trains are often subject to great delays along the way. Boats can and do receive and discharge cargo at ship-side no matter how congested the wharves and terminals may be. Freight cars cannot reach ship-side until the track and wharf ahead are clear.

No Congestion in River Traffic

There is practically no limit to the number of boats that can be operated on the larger navigable streams. Railroad congestion is due, in part, to inability to operate any more trains over existing tracks than is now being done.

"In handling the commerce of the country there is plenty of room for both the boats and the railroads. Coordination between the two systems of transportation will help them to assist one another to the credit of both and the profit of the country.

"Besides freight handling and storage facilities at boat side, each community should see to it that there is physical connection between the boats and the railroads, so that the interchange of freight can be carried on in an economical fashion."

How to Prolong Lake Navigation Season

By Joseph Wenzel,
of the Mackinac Transportation Co.

THE question of a longer season of navigation on the Great Lakes is a vital one. This subject has been brought up many times in the past, but no conclusions have ever been reached. Just now the question is being discussed pro and con by vesselmen, shippers and others interested, on account of the very late opening this year. In my judgment it is lack of confidence that is holding back action that will hasten the opening of navigation and prolong it to the end of December. Vesselmen make suggestions, shippers demand tonnage for quick movement in the spring and fall, others offer suggestions. Yet, no one seems to get the confidence to make the start.

I believe navigation on the Great Lakes can be opened two or three weeks earlier than usual, and kept open until the end of December, with three specially constructed boats. If the vesselmen, shippers, congressmen and others interested would get together and discuss this subject in its true light and realize fully what it means to the country at large, especially during the war, they would get the confidence to do something and have the three boats built so a start could be made next April. Let everyone interested get together and get this matter started. Confidence, with patient captains, competent engineers, good management, and three specially constructed boats, in my judgment, would make a 9-month season of navigation on the Great Lakes a certainty, instead of a season of seven and one-half months. Under such conditions, the profits of the vessel owners would be greater, shippers would obtain better dispatch, and there would be no shortage of fuel at the head of the lakes and no full elevators waiting for the opening of navigation. The whole country would be benefited.

The three boats I have in mind should be built from the same plans. They should be 200 feet long and 41 feet beam, with the beam carried well forward so as to prevent wedging in the ice. A spoon-shaped bow with a forward propeller is recommended, together with a single propeller aft. Each propeller should be solid cast steel, 9½ feet in diameter. Solid propellers are preferred to the sectional type, which is practically useless in ice, due to the ease with which the blades break off. The car ferries at the Straits of Mackinac have been bucking ice since 1888 with solid cast

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propellers and they have never broken a blade in the ice. Two engines should be installed, each engine to develop 2000 horsepower, making a total of 4000 horsepower per boat, engines to be placed in one engine room amidships. This arrangement will require but one engineer to a watch where with two separate engine rooms, an engineer for each room will be required. Furthermore, it is advantageous, of course, to have all the machinery together. Two batteries of boilers, one forward of the engine room and one aft of the engine room, should be installed. Each battery would have three boilers, each boiler developing steam at 200 pounds pressure.

The draft of these boats must be from 14½ to 16 feet. The propellers must be set low so as to utilize every bit of power. The boats must be well constructed, with the frames close and well plated. A water bottom, divided into eight compartments, four on a side, should run the length of each boat. A valve arrangement in the engine room would be needed whereby with a large centrifugal pump each tank can be emptied separately and very quickly. With such an arrangement the boat can be rocked and the bow raised or lowered, in a way that will be of great assistance in freeing the boat, should she become fast in the ice.

The tanks should always be full of water when breaking ice so that if the boat becomes fast in a windrow, she can release herself by emptying the tanks, thus causing the boat to rise and allowing water to get under and float the boat off the windrow.

One boat should be stationed at the St. Mary's river, one at the Straits of Mackinac and the other at the Detroit and St. Clair rivers. In operation, for example, when a fleet of boats arrives at the mouth of the Detroit river, the ice breaker will lead the way through to Lake Huron. These boats with a beam of 41 feet will break a channel wide enough to allow any vessel on the Great Lakes to pass. When the fleet arrives at Lake Huron the ships will pass up the lake escorted by a large, powerful tug in case they should meet with a floating field of ice out in the lake. The ice breaker would then return through the rivers escorting the downbound fleet. This system would apply to the Straits of Mackinac and the St. Mary's river.

Boats of 200 feet keel and 41 feet beam will undoubtedly work through any ice formation on the Great Lakes. The handling of these boats will have to be placed in the hands of competent and patient captains. The engineers must be men who thoroughly understand machinery as hard work is required from the engines when working in ice and consequently all machinery must be in first-class condition at all times. With boats of 200 feet keel, by working the propellers opposite, should the boats become fast in the ice, the current from the propellers will finally wash away the ice from around the boat and clear it. With boats of greater length, this can not be done, as the current having too long a distance to travel, loses its force and cannot wash the ice clear of the boat.

This proposition should be financed either by the government or by a stock company. If financed by the former, the government should build, maintain and operate the boats. If a stock company is formed, the stock should be kept among the vesselmen, shippers and others interested. The income would be derived by assessing each vessel that passes through the channels made by the ice breakers, a fixed sum per ton of freight. This assessment should be sufficient to pay for all maintenance, operation and overhead expenses, with provision for depreciation, sinking fund and dividends. The vessels that would be operated through the ice should receive a higher rate for carrying freight during this period of navigation as the vesselmen would be under a greater expense due to slower operations. In this way the cost of operating the ice breakers would be scattered among the shippers who would in turn place it on the commodity carried and in this way every one benefited by the movement of freight in the fore part of April and through the month of December, would be paying their just proportion of the additional expense.

These boats could be used during the summer months as pontoons on wrecks. The forward engine would be placed in ordinary as there would be no requirement for its use except during the ice period.

Concrete Transports to Aid Shipping

NECESSITY for a large merchant marine, to be used not only for the transportation of supplies and troops during the period of the war, but also to strengthen our commercial interests now and after the war has served to give credence and impetus to plans for building ships of concrete. Early investigations in this field were described in the August issue of THE MARINE REVIEW, which also outlined several new projects in various stages of development.

Building Material is Available

Recent information gathered by the Portland Cement Association, Chicago, and published in a booklet titled "Concrete Ships", points out that the materials required for constructing vessels from concrete are available in the necessary quantities and that little skilled labor is required for the work. Ships built from this material may be constructed rapidly at a very moderate expense. These "stone" boats require little maintenance and are not subject to damage by fire.

The details of proposed concrete vessels are outlined by a well-known construction engineer who states:

"My plan makes little if any change in the outward appearance of our modern steel ship, except that the structural part of the ship is of a specially prepared emulsified concrete reinforced with a fabricated network of steel rods that binds the ship together in every part, giving great strength and making the structure one continuous monolith. All decks, partitions, etc., are interwoven together in one continuous mass of steel and concrete. The ship has two hulls and a double bottom; the double hull runs to above the water line all around the ship. There is a space of 3 feet between the outer and inner hull which is divided every 12 feet making a continuous number of watertight compartments 3 x 12 feet girding every part of the ship to above the water line. In the center of this space is a system of fabricated steel rods looking somewhat like a heavy wire fence; the purpose of which will be explained later. This space between the double hulls and double bottom is not wasted, but being watertight, is used for carrying oil cargoes and for storing fuel for the ship's engines, the vessel being driven by oil engines, requiring a much smaller crew than a steam-driven vessel and giving more space for freight.

Double Hull Gives Strength

"The designs and methods of fabricating the steel reinforcing rods are such as to make a ship strong enough to resist the heaviest sort of a gale without straining herself, yet no attempt is made in this plan to build the outer hull heavy enough to resist the explosion of a torpedo; so let us sup-

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pose such a ship is struck by a torpedo fired from an enemy submarine; the force of the explosion is so great that a hole 2 or 3 feet in diameter may be shattered in the outer hull, and now appears the use for the fabricated rods inside the space between the two hulls.

"These rods work on the same principle as Mr. Maxim's gun silencer, they dissipate, or in other words break up the force of the explosion, at the same time they protect the walls of the inner hull from being damaged by flying pieces of the concrete; thus a section 3 x 12 feet is damaged and its cargo of oil is thrown against the force of the explosion, but this of itself helps to cool the hot gases caused by the explosion; each 3 x 12-foot section is vented at the upper deck with a hatch that opens outward to let the explosive gases escape. The torpedo has now done its worst and the ship has lost a few hundred gallons, maybe, of fuel oil, but the damage can readily be repaired in a few hours on arrival at her destination, or even while at sea if necessary, as concrete will set in water without decreasing its strength.

"It will also be seen that if a vessel of this kind should be damaged by collision or by striking a rock or an iceberg, only her outer hull would be damaged, while her freight and passengers are carried to their destination in safety."

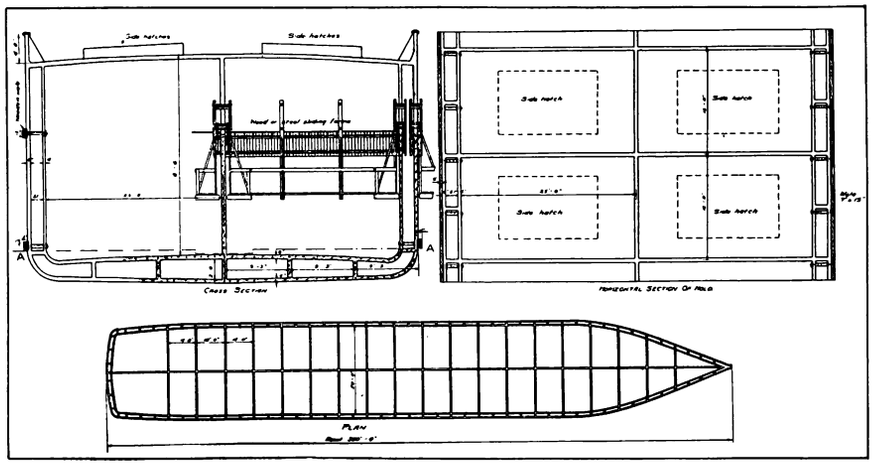
Would Apply Concrete Under Pressure

A slightly different plan for the construction of concrete ships has been developed by Carl Weber, president of the Cement Gun Construction Co., Chicago. Mr. Weber proposes to use a steel framework which will be covered with several layers of concrete applied by means of air pressure in a series of laminations.

The accompanying illustration shows the details of a type of concrete boat designed by E. Lee Heidenreich, Kansas City. The hull consists of five vertical longitudinal trusses, three horizontal trusses and a series of transverse bulkheads which may be pierced with small or large openings as desired. It is figured that a 5000-ton transport of this design would require 3000 cubic yards of reinforced concrete costing about $20 a yard or $60,000 for the hull. It is said that approximately 90 days would be required to construct such a hull. The supports for the engines, tanks and hoisting machinery are to be built of structural steel and concrete. The bottom and bilge, up to the line *AA* in the illustration are to be constructed by using collapsible wood or steel forms.

Pacific Marine Iron Works

One of the largest and best equipped plants on the Pacific coast for the manufacture of large-size marine engines and water-tube boilers is about ready for operation at Portland, Oreg. It will devote itself primarily to the construction of propelling machinery for Emergency Fleet ships, having orders already booked for about 16 triple expansion engines and about 50 Ballin water-tube boilers. The company is capitalized for $125,000. Fred A. Ballin is president and J. L. Jennings will be secretary and general manager. Mr. Jennings resigned last month from his position as general superintendent of the Seattle Construction & Drydock Co., Seattle. The new shops are located in Portland, between Main and Madison streets, from Water street to the river, covering an area of nearly 2½ acres. The main shop will have a length of 300 feet and a width of 90 feet.



DETAILS OF PROPOSED CONCRETE TRANSPORT

The British steamship MATOPPO was damaged by fire at Boston to the extent of $20,000 and cargo $100,000. Ship was taken to New York for repairs.

The British government has ordered that ships leaving Boston carry 93 per cent of their cargoes to government account and this condition is making it difficult for exporters to forward general merchandise, some of the freighters not having space to spare as their shipments of munitions send them to the Plimsoll mark without utilization of the 7 per cent space allowed.

The shipping and maritime committee of the associated chambers of commerce of the Pacific, composed of prominent shipping men representing all interests, held a session at Seattle for the purpose of launching plans for co-operating with the government during the war and also for developing the American merchant marine permanently. The committee intends to father the revision of maritime laws and to outline a plan for educating officers for the merchant marine.

Lake Men Saving Money

The race for cash prizes offered by the Cleveland Trust Co., Cleveland, for the two best saving crews in the lake fleet is now on in earnest, it is stated in the July *Bulletin* of the Lake Carriers' Association, and until the close of navigation the contests will overshadow all other topics that come up for discussion aboard the boats.

Now to the figures. Last year close figuring was required to make up a list of 10 vessels that had savings of $700 or more in the month of May, but it was finally done by finding that the ANGELINE topped the necessary sum by just $2. But this year there are 15 vessels that come up to last year's requirements and no trouble was had in finding them, for the last in the list, the ROMAN, comes in on a liberal margin. In the table last year there were only four steamers in the select list of $1000 or more to their credit, but this year the number is doubled, and the SHENANGO, which made such a good fight of it last year, tops the list. Close to her are three of her fleet companions, so it is now up to the WILLIAM P. SNYDER to come along with a good, big deposit and make this a 100 per cent fleet. The steamer JOHN STANTON, that was represented in the opening statistics last year, is back this season with a considerably larger sum, and the HENRY STEINBRENNER, that topped the list at this time in 1916, comes back, although with a reduced amount, as an indication that her crew will have something to say about prize money next winter. The steamers J. P. REISS and S. F. B. MORSE, that never before figured in the column of statistics, are both credited with more than $1000, while the MARQUETTE, that was as consistent as the SHENANGO last year, is back in place. Following is the list of 15 vessels whose

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crews deposited more than $700 in May:

Contest No. 1

Shenango	$1,567.76
Col. James M. Schoonmaker	1,418.00
Marquette	1,226.00
Wilpen	1,198.00
Wm. P. Snyder, Jr.	1,095.00
John P. Reiss	1,094.00
John Stanton	1,071.60
Samuel F. B. Morse	1,043.40
Wm. A. McGonagle	988.60
Simeon J. Murphy	865.00
Leonard B. Miller	860.00
Angeline	853.00
Henry Steinbrenner	752.00
Daniel J. Morrell	728.40
Roman	720 91

Inasmuch as a very large number of vessels have substantial permanent bank balances, Contest No. 2 should settle into an interesting race. As the rules provide that the winner shall be the vessel with the largest balance on Dec. 31 from deposits beginning May 1, all accounts previous to May 1 are deducted from in the figures below, and hence do not indicate the vessel's total balance. Also there have been deducted the withdrawals during the month, so that the following sums show the actual balances on hand of the deposits made in May:

Contest No. 2

Shenango	$1,457.75
Col. James M. Schoonmaker	1,418.00
Wilpen	1,083.00
John Stanton	1,071.60
Wm. P. Snyder, Jr.	1,015.00
Marquette	977.70
John P. Reiss	931.21
Wm. A. McGonagle	923.60
Samuel F. B. Morse	920.60
Simeon J. Murphy	815.00

The rules governing the contests have been published. Briefly repeating, there are two prizes of $50 each, one for the crew whose vessel makes the largest amount of deposits between May 1 and Dec. 31, and the other to the crew whose vessel shows the largest balance on hand from the money deposited during the same period. In other words, this last prize is for the crew that keeps its money on deposit.

Riding the Hatches

Despite all precautions, some accidents cannot be prevented because some men will not heed a warning. The danger in riding the hatches is as well known as is the foolishness of the practice. But accidents from this cause will crop out and one with fatal results occurred aboard the steamer R. L. IRELAND at Conneaut on May 15, it is stated in *The Bulletin* of the Lake Carriers' Association. John Kobelevski, a Russian by birth, was an habitual hatch rider. One day when the master of the IRELAND caught Kobelevski at the trick he grabbed him by the neck and threw him off, warning him never to be seen at it again. On the fatal day Kobelevski persisted in his foolhardy play. The boatswain warned him three times. On Kobelevski's fourth ride the hatch gigged a little, stopped, and starting up with a jerk, threw him backward into the hold and he was killed.

Must Have Water Purifiers by Spring

THE determination of government officials to enforce the regulations regarding the use of water-purifying systems on board lake and river vessels was vigorously emphasized a few days ago by Surgeon General Rupert Blue, chief of the bureau of public health service. Federal authorities believe that plenty of opportunity will be afforded during the closed season on the lakes for boats not now equipped to install suitable purifying apparatus.

The attitude of the government was made clear by General Blue in an interview with the Washington representative of THE MARINE REVIEW. The interview was secured in order that ship owners who are anxious to learn the views of the public health service on the question of water purification might know exactly what these views are.

Health Service Will Do Its Share

Surgeon General Blue first pointed out the desire of the public health service to co-operate with ship owners in every effort to expedite the installation of purifiers with as little friction and delay as possible.

The part which the Canadian government played in securing an extension of the time set for installing purifiers also was revealed by General Blue. He stated that two factors had induced the government to rescind its original determination that all lake boats must be equipped with water purifiers before being permitted to sail last spring. The emergency situation caused by the war was one factor, as the government recognized the great importance of securing the maximum possible movement of iron ore, coal and grain during the present season. The attention of the public health service undoubtedly was called by the various government departments immediately concerned, to the imperative necessity of not retarding the movement of freight on the Great Lakes at a time when the war would place a huge demand upon the industries most affected by the bulk freight handled on the lakes.

The second factor was the request of the Canadian government that further time be granted to ship owners to comply with the bureau's regulations. This request was based upon the desire of the Dominion authorities to promote the maximum movement of freight on the lakes this season.

The government, according to General Blue, expects to enforce its original ruling at the opening of navigation next season. In other words, the federal authorities expect next year to consider water purifying apparatus as a necessary part of the ship's equipment. The official head of the government's health supervising organization recited that lake vessels could be suitably equipped to comply with the regulations during the winter months when the ships were laid up in port.

The information secured from General Blue in the interview is of interest to vessel owners on the Great Lakes as it clears up the uncertainty felt by some over the attitude the government might take next spring toward ships not equipped with water-purifying apparatus. The information also is of interest to owners of river boats as the government, undoubtedly, is determined to see that these vessels comply with the regulations of the public health service.

Reduction of Merchant Marine

In January, 1916, the Spanish government adopted measures to prevent the depletion of the Spanish merchant marine through the sale of vessels to foreign countries. The tonnage of the Spanish merchant marine at the end of 1915 had been reduced through the sale and loss of vessels to 799,245 gross tonage, but during the past six months vessels have been constructed in the national shipbuilding yards amounting to 22,440 tons, making a total of 821,685 gross tonnage. However, the losses to the Spanish merchant marine have amounted to 147,791 tons, 70,000 representing the tonnage of vessels sold, 27,783 the tonnage of vessels sunk by submarines, 23,008 the tonnage of vessels sunk by mines, and 27,000 that lost in other ways. These losses reduce the available tonnage of the Spanish merchant marine to 673,-894, a decrease of almost 18 per cent.

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What the Government is Doing

Rulings on Marine Matters **Improvements to Waterways**

Hints to Navigators

Urgent Appeal for Officers

THE United States shipping board recruiting service, Henry Howard, director, is taking a country-wide census of licensed mariners, in order to deal intelligently with the present emergency. The board urges all licensed mariners who are engaged in shore occupations to come back to the sea, for the new merchant marine will need great numbers of competent men.

Data covering the numbers of licensed officers, together with the grades of ocean and coastwise licenses which they hold, have been prepared here for the recruiting service by the United States steamboat inspection service.

There are about 40,000 licensed officers. Many are not now engaged in the seafaring profession. These are all men of considerable sea experience, and it is this class that the board is now urging to return to the sea.

Some leading authorities believe that all men who hold licenses should be drafted and forced to assist the government in the present emergency. Others believe that unless the men come forward and serve willingly their licenses should be taken away.

A letter which will go forward from Henry Howard to every person in the country holding a license as officer of an ocean or coastwise steam or sail vessel will say, in part:

"The recruiting service of the United States shipping board is at present engaged in compiling detailed statistics as to the number of persons holding United States licenses as officers of ocean or coastwise steam or sail vessels, their present address and occupation.

Opportunities are Great

"This information is desired in order that this service may have a ready reference list of all officers available for service in the large number of vessels that will be placed in coastwise and overseas service.

"Opportunities for the advancement of licensed officers were never so promising as at the present time; and salaries are on a higher plane than ever before.

"It has been said that to win this war, the United States must provide ships in large numbers to offset the activities of the enemy submarines. These ships are required for the maintenance of our military forces on the battlefield and also to supply food and supplies to our allies.

"Ships are now being built as rapidly as the facilities of our shipyards will allow. There are now under construction about 1,500,000 tons for private order for service in the coastwise or overseas trade; and in addition there are 1,900,000 tons building for government order for overseas service. Stupendous as these figures may appear, as compared to previous records of shipbuilding in this country, even this output will be materially increased as additional shipyards are completed. As soon as these ships are completed, work will be commenced on others, contracts for which have already been let.

"With the ships assured, the problem is presented of securing a sufficient number of licensed officers to man the vessels as they are made ready for service.

"These are days of self-sacrifice for every liberty-loving American. The world must and shall be made free that future generations may enjoy the blessing of liberty, and you, of course, realize the important part the officers and seamen of our merchant marine must take to bring success to the cause of democracy.

"The American seaman has never been a slacker, and history records that in every case of danger to our nation, he has come valiantly to his country's aid without thought of personal comfort or advantage; and there is every reason to believe that the seamen of the present day will be just as patriotic as their predecessors. Are you willing to do your part to preserve the glorious traditions of our merchant sailor?

"The United States shipping board, through its recruiting service, is now engaged in educating both deck and engineer officers free of charge, having established schools in cities along the seaboard and Great Lakes.

"In addition, the recruiting service is taking a census of the officers at present holding license in order that it may intelligently deal with the situation at hand. You are, therefore, requested to fill out the enclosed card and return it as soon as possible. To insure accurate records, you should be careful to see that all blanks are properly filled in and contain the correct information.

"Your country desires your service."

Letting Down the Bars

At a meeting of the executive committee of the board of supervising inspectors of the steamboat inspection service recently the sulphur limit in open-hearth steel for boiler plate was raised from 0.04 to 0.05 per cent in order, it is stated, that production may be increased without lessening the safety of this material. Rules regarding the stamping of boiler plates also have been revised to read as follows: "Every iron and steel plate intended for the construction or repair of boilers to be used on steam vessels shall be stamped by the manufacturer at two diagonal corners at a distance of about 18 inches from the edges." Previously the distance was 8 inches.

The executive committee also amended the general rules and regulations of the board of supervising inspectors relating to ocean, coastwise and lake shipping, other than the Great Lakes, bays and sounds, in regard to experience qualifications required for license as master, mate, pilot and engineer of vessels. The amendments received the approval of the secretary of commerce.

The length of service required for license has been reduced in some instances, and some option as to service requirements for license has been left to the judgment and discretion of the local inspectors examining applicants for license.

These modifications of the rules and

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regulations have been rendered necessary by the demand for officers to man vessels now being added, and which will in the near future be added in large numbers to the merchant fleet of the United States, and on account of a large number of officers having given up their positions as officers of vessels to accept more lucrative employment.

Candidates for positions as officers of merchant vessels are being intensively trained for the various kinds of duties required on merchant vessels, many of whom would lack the experience qualifications required for license without modification of the rules.

The amendments of the rules, including the scope of the examinations required for license, are fully set forth in a circular issued by the steamboat inspection service.

July Lake Levels

The United States lake survey reports the stages of the Great Lakes for the month of July, 1917, as follows:

Lakes	Ft. above mean sea level June	July
Superior	602.60	602.65
Michigan-Huron	581.53	581.95
St. Clair	576.31	576.72
Erie	573.53	573.86
Ontario	246.98	247.46

Lake Superior is 0.05 foot higher than last month, 0.95 foot lower than a year ago, 0.17 foot above the average stage of July of the last ten years, 1.17 feet below the high stage of July, 1876, and 1.17 feet above the low stage of July, 1879. During the last ten years the July level has averaged 0.2 foot higher than the June level and 0.2 foot lower than the August level.

Lakes Michigan-Huron are 0.42 foot higher than last month, 0.77 foot higher than a year ago, 1.11 feet above the average stage of July of the last ten years, 1.63 feet below the high stage of July, 1876, and 2.05 feet above the low stage of July, 1896. During the last ten years the July level has averaged 0.1 foot higher than the June level and about the same as the August level.

Lake Erie is 0.33 foot higher than last month, 0.64 foot higher than a year ago, 1.06 feet above the average stage of July of the last ten years, 0.55 foot below the high stage of July, 1876, and 2.40 feet above the low stage of July, 1895. During the last ten years the July level has averaged 0.1 foot lower than the June level and 0.2 foot higher than the August level.

Lake Ontario is 0.48 foot higher than last month, 0.47 foot lower than a year ago, 0.55 foot above the average stage of July of the last ten years, 1.26 feet below the high stage of July, 1862, and 2.87 feet above the low stage of July, 1895. During the last ten years the July level has averaged 0.1 foot lower than the June level and 0.3 foot higher than the August level.

Surveyor in Service

The new steamer SURVEYOR, of the coast and geodetic survey, department of commerce, has been placed in commission. She made the trip from the yard of her builders, the Manitowoc Shipbuilding Co., Manitowoc, Wis., to Washington via the St. Lawrence river, manned by officers and crew of the coast and geodetic survey. She stopped at the Portsmouth navy yard for her launch equipment and at the New York navy yard for supplies.

The SURVEYOR is an all-steel vessel of 1000 tons displacement designed for work as an off-shore surveying ship in the North Pacific, particularly off the coast of Alaska. She is 183 feet long, 34 feet beam and 12 feet loaded draft. Power is furnished by a single triple-expansion engine of 1000 horsepower. The vessel burns fuel oil and has a storage capacity of 75,000 gallons, enough to carry her 5000 miles at full speed or 7500 miles at working speed. A complete description and drawings of the SURVEYOR were published in THE MARINE REVIEW, July and August, 1915. Inclining tests on the SURVEYOR have shown an ample reserve of stability. Her turning radius at full speed is about 300 feet. She can be stopped from full speed ahead in 1 minute and 20 seconds within 480 feet.

Government Rulings

The following rulings were made recently by the steamboat inspection service relating to transportation of certain articles on vessels:

Roofing cement manufactured by the International Roofing Co., Chicago, shall not be transported on steamers carrying passengers. Inquiry presented by local inspectors, New York.

Under date of Sept. 14, 1915, the bureau ruled that *"unhydrated or quicklime* shall not under any conditions be transported on steamers carrying passengers." This was published in the rulings of Oct. 1, 1915. On Feb. 21, 1917, the bureau ruled that *unhydrated or quicklime* may be transported on steamers carrying passengers when contained in strong, watertight metal receptacles and stowed on deck. Inquiry presented by the Portland chamber of commerce, Portland, Ore.

Roofing cement that has been approved by the bureau for transportation on steamers carrying passengers may be enclosed in rolls of roofing paper and so transported on such steamers. Inquiry presented by the Paraffine Paint Co., San Francisco.

Pioneer liquid asphalt roofing cement may be transported on steamers carrying passengers.

Unhydrated or quicklime may be transported on steamers carrying passengers when contained in strong, watertight metal receptacles or in strong, heavy, water-tight barrels, such as wine or whiskey barrels, and shall be stowed on deck.

No. 3 patent-leather repairer shall not be transported on steamers carrying passengers.

Ethyl chloride and *methyl chloride* shall not be transported on steamers carrying passengers.

Lake Buoy List

A buoy list for Lake Erie, Lake Ontario, and the St. Lawrence river (10th district) has been issued by the United States bureau of lighthouses. It is corrected to April 1, 1917, and includes all classes of aids to navigation. Ship masters and pilots may obtain copies free of charge from the division of publications, department of commerce, Washington, D. C.

Shipping Board Methods

On account of the tremendous importance of its shipbuilding program, the ordinary work of the United States shipping board has been somewhat obscured. The board, however, has now completed its organization for handling proceedings under the shipping act. A pamphlet containing the rules of practice of the board has been issued. In addition to prescribing methods for filing complaints, conducting hearings, preparing evidence, etc., the pamphlet contains a series of forms covering formal complaints, intervening petitions, answers, motions to dismiss, petitions for rehearing, statements of reparation, etc.

Contribute Liberally

During the recent Liberty Loan campaign, Seattle shipyard employes contributed liberally and no small portion of this city's share was raised in the waterfront plants. As an illustration of the aid extended by employers, the Seattle Construction & Dry Dock Co. accepted subscriptions from its men on a basis of 10 per cent cash and 10 per cent a month, no interest charged on deferred payments. In the same industries the Red Cross appeal met with spontaneous and patriotic response.

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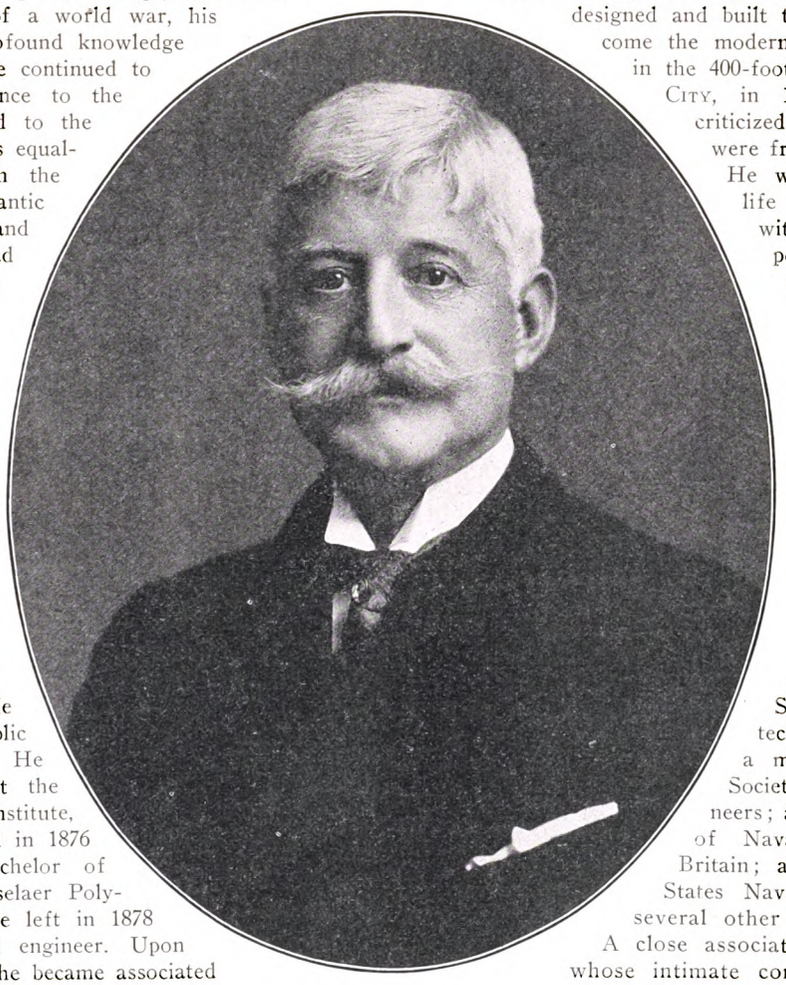
W. I. Babcock, Noted Architect, Dead

His Work Has Left an Indelible Impress Upon Shipyard Methods Followed in Coast and Lake Plants—Introduced Pneumatic Tools in Shipbuilding Work

WASHINGTON Irving Babcock, naval architect and engineer, died on Aug. 7 at his home in New York. For many years he had easily ranked among the leaders in his profession, not only in the United States, but throughout the world. The advances in naval architecture, for which he was largely responsible, for several decades past, have had an immense influence upon the design and construction of ships. At a time when the entire maritime industry is undergoing an epochal change, due to the ravages and exigencies of a world war, his broad experience and profound knowledge had been and would have continued to be of invaluable assistance to the shipbuilding industry and to the country at large. He was equally well known on both the Great Lakes and the Atlantic ocean. His professional and business activities had brought him into intimate contact with the shipbuilding industries located both on fresh and salt water. Both the modern lake freighter and the ocean-going steamer are mute testimonials to the improvements in design which he originated and executed. Mr. Babcock was born at Stonington, Conn., on Sept. 26, 1858. He was the son of Capt. David S. Babcock. He was educated in the public schools of Brooklyn, N. Y. He then took the course at the Brooklyn Polytechnic institute, from which he graduated in 1876 with the degree of bachelor of science, and at the Rensselaer Polytechnic institute, which he left in 1878 with the degree of civil engineer. Upon leaving the latter school, he became associated with Morgan's Iron Works, New York City, and a few months later with the old firm of John Roach & Sons, Chester, Pa. He was with the Roach firm from 1878 to 1885. For the next two years he was with the Providence & Stonington Steamship Co., and in 1887 assumed the superintendency of the Union Dry Dock Co., Buffalo. Two years later he joined with a number of Cleveland business men in organizing the Chicago Shipbuilding Co., of which he became general manager. Ten years later he became president, which post he held until the absorption of the yard in 1900 by the American Ship Building Co. Since that time he had been in the consulting business in New York. In 1907, Henry Penton, formerly engineering manager of the Chicago Shipbuilding Co., and later chief engineer of the Great Lakes Engineering Works, joined Mr. Babcock under the firm name of Babcock & Penton. The business has since been conducted under that title, with offices at New York and Cleveland. Mr. Babcock was as well or better known than any other naval architect in this country. By many he is given credit for initiating greater advances in shipyard methods than any other man of his time. He introduced and adapted pneumatic tools to shipbuilding, an improvement which he was forced to evolve, owing to the labor problem at Chicago. The mold system, now universally used in shipyard work, was introduced by him. He designed and built the first of what has become the modern standard bulk freighter, in the 400-footers, VICTORY and ZENITH CITY, in 1892. He was severely criticized at that time for what were freely termed radical views. He was associated during his life in an advisory capacity with many of the most important improvements in shipbuilding on the coast.



WASHINGTON IRVING BABCOCK
He Introduced Pneumatic Tools in Shipyard Work and Was a Pioneer in Developing the Bulk Freighter

By the friends who knew him well, Mr. Babcock will be remembered as a man of the highest character and one whose friendship was greatly valued. He held strictly to the highest ideals of honor in even the least important transactions. He was a vice president and member of the council of the American Society of Naval Architects and Marine Engineers; a member of the American Society of Consulting Engineers; a member of the Institute of Naval Architects of Great Britain; a member of the United States Naval institute; as well as several other technical organizations. A close associate of Mr. Babcock—one whose intimate contact almost daily with the famous architect places him in a splendid position to discuss familiarly the character and accomplishments of Mr. Babcock—has prepared for THE MARINE REVIEW the following tribute:

"Mr. Babcock was possibly the best known naval architect in the United States and was responsible for greater advances in the methods followed in shipyards, than any other man. His introduction of pneumatic tools into the shipbuilding industry affords an insight into his resourcefulness when confronted by emergencies that would have deterred almost anyone else. When he began, a quarter of a century ago, to develop the bulk freighter, now so generally employed on the Great Lakes, he was opposed by many who criticized his views as radical. Nevertheless, he carried his point and the ships which he built in 1892 were the forerunners of those efficient carriers which are peculiar to the lakes."

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In the Traffic Manager's Office

A Review of the Month on Coasts and Lakes—Useful Pointers for the Men Who Get the Business

Japanese Are Building Big Ships

THE lead that Japan has obtained in commerce on the Pacific is reflected in a report from Consul General George Anderson at Hongkong that the Toyo Kisen Kaisha, the largest Japanese steamship company in the transpacific trade, is building a new steamer designed to be the largest and the fastest on the Pacific for the express purpose of supplying the best passenger service yet attained between the United States, Japan and the east. This vessel will engage in express service between San Francisco and Yokohama with connections at Yokohama for Hongkong and Manila, and stops both ways at Honolulu.

By confining the service of the larger and faster ships to the Yokohama-San Francisco run, and allowing the service between Hongkong and Yokohama to be taken over by other lines and smaller ships, the available tonnage across the Pacific will be materially increased.

"The new vessel," says Consul General Anderson, "is to have a length of 636 feet, about 46 feet longer than the Empress ships of the Canadian Pacific ocean service, which now furnishes the fast service across the Pacific. The ship will have a speed of 23 knots, accommodations for 300 first class passengers, 100 second class and 800 steerage passengers, and every possible convenience and luxury. It will compete with the Canadian Pacific and any ships American companies may place on the Pacific. It will be followed by other ships of the Empress class.

"The inauguration of the express system from Yokohama to San Francisco emphasizes the policy of the Japanese lines, under government subsidy, to serve Japanese interests first, leaving Manila and Hongkong interests and American trade there to be taken care of by other means.

"The fast service will be of special advantage to Japanese silk interests, since the short voyage reduces interests charges on valuable silk cargoes to a minimum. Inasmuch as Japanese silk interests in the last few years have developed almost a complete monopoly of the raw silk trade with the United States, this fast service is likely to increase materially the hold of the Japanese silk dealers upon American manufacturing interests.

"It is becoming more and more evident that if there is to be any material improvement in the shipping service between the United States, Hongkong and Manila, it must be from American sources.

"The keenest sort of competition in passenger and freight service on the Pacific is expected at the close of the war, and the character of the vessels already in service or under construction is such that only those of the highest class may hope to have a reasonable part in the trade."

Coal Shippers Study Lake Problem

Coal shippers on the Great Lakes are actively co-operating to maintain the volume of traffic at a maximum figure in order that there may be no shortage of fuel at upper lake points next winter. Shipments are heavy and the beneficial results of the decisive steps which have been taken in Cleveland already are apparent.

Daily meetings are being held in Cleveland by the coal shippers to facilitate the dispatch of cargoes. One of the first meetings was held at the office of Harry Coulby, president, Pittsburgh Steamship Co., July 31. F. C. Baird, commissioner of the Lake Erie Bituminous Coal Exchange, attended this meeting. It was arranged to have the shippers report every day the amount of coal they have lined up and the amount of vessel capacity available. The boats in some cases will be late in reporting for cargoes and it is planned to have the shippers trade tonnage in order to release the cars and keep the docks going at full speed.

It is believed the new plan will greatly improve dispatch all along the lakes, particularly at Toledo and Sandusky where there has been considerable delay. There has been an embargo on coal on the lines running into Toledo most of the time since the middle of July. As a result, coal belonging to shippers that have plenty of capacity has been cut off as well as that consigned to shippers short on steamships.

The lake fleet has always done its part in handling both coal and iron ore and there is no doubt that this year everything will work out satisfactorily if the railroads at lower lake ports only do their part.

New York Harbor as a National Asset

New York harbor is a national rather than a state inheritance and responsibility, according to a recent statement by Herman de Selding, New York. He asserts that as such all appropriations for the benefit of the harbor should come by resolution of congress, out of the national treasury, as the benefits to be derived by development and expansion is for the country at large. He points out that the same conclusion has been reached by such prominent men as Irving P. Bush, president of the Bush Terminal Co., and by ex-Congressman Perry Belmont.

"New York harbor is a national investment," said Mr. de Selding. "There is now needed large appropriations to deepen channels and remove dangerous obstructions to navigation. New York port, which handles more than one-half the foreign commerce of the entire country and contributes more than 76 per cent of the customs dues, has only received 2.68 per cent of the appropriations made by the federal government for waterway improvements.

"The City of New York has expended on the 127 miles of water frontage owned by the municipality (the harbor frontage is about 450 miles) for improvements approximately $150,000,000 to date. Continental United States has a population of about 103,000,000 and is rapidly growing. Have we fully real-

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ized the importance of this condition? Are we ever again, by the development of our commerce, to see our 'flag on every sea?' At the beginning of the present war Great Britain (exclusive of the colonies) had 453 ship yards, engines and boiler shops where marine vessels could be built. To drydock and repair her war ships and vessels of her merchant marine she had 572 dry docks and marine railways.

"America has 152 ship yards, marine engine and boiler shops, and 239 dry docks and marine railways. In 1913 the present energetic commissioner of docks presented tentative plans for the construction of a dry dock sufficiently large to accommodate the modern passenger steamship—the dock to be built on city-owned land in South Brooklyn, acquired in 1906. The estimated cost of this dock was $2,500,000. There was reasonable assurance that considerable revenue would be received from such an undertaking, particularly as it was provided that when the dock was not in use, vessels might lay alongside and receive and discharge cargo, berth room 1,000 feet long and 120 feet wide being provided. The location was ideal from every standpoint. No dry dock capable of holding a modern vessel existed in this port, and such is the case today. A disabled liner may limp into New York, find it necessary to go into dry dock only to learn she must be towed to Newport News, because of the lack of an adequate dock at this, the greatest port in the world!

"The present congestion of freight, so bitterly complained of as being one of the reasons for the high cost of foodstuffs, is not entirely due to the war, but largely to the fact that we have not kept pace here, where every natural facility offers, with a continually growing demand.

"There are not sufficient piers and wharves in New York harbor at the present time to handle expeditiously the merchandise brought here by the railroads. But a small portion of all the stuff brought to this seaboard is consumed locally. It must therefore follow, the western shipper bears the loss of demurrage and thus lessens his profits. Is not the farmer interested in getting his crops handled quickly and put on shipboard, even though sold to a 'middleman' in his home town? The longer we delay, the greater the cost will be of developing our wonderful resources."

Mr. Bush says: "If New York harbor is to achieve its full destiny and usefulness to the country, there must be implated in the minds of all the people of the United States the fact that its development is a national problem. This fact has seemingly not been recognized in the past."

Wants Coastwise Laws Suspended

Congress has been asked by the United States shipping board to approve a resolution empowering the President to permit vessels of foreign registry to engage in the coastwise trade. The resolution is designed primarily to permit Canadian vessels on the Great Lakes to engage in coastwise trade. The suggested resolution reads:

"Resolved, That during the present war or emergency the President may, if in his opinion the interests of the United States so require, permit by proclamation vessels of foreign registry to engage in the coastwise trade of the United States, within such limits and under such conditions as he may deem wise."

Secretary of Commerce Redfield states that "the chief purpose of the resolution is to allow Canadian vessels on the Great Lakes to do coastwise business between American ports. The Canadian government very handsomely acted on the matter some time since as concerns us, allowing the coastwise privilege to American vessels in Canadian ports.

"There is urgent necessity for the employment of all possible tonnage on the Great Lakes in the coal and iron ore hauling. Owing to the very late spring the navigation season opened some three weeks late. Also, the railroad situation at that time was complicated by some confusion and car shortage. Consequently the stocks of coal at lake distributing points are thousands of tons short of what they should be. If we have an early winter and consequent closing of lake navigation there would be caused much suffering, and damage to industry in the northwest on account of shortage of coal.

Must Use Every Ship

"So it is important to get every possible bottom carrying coal to the northwestern points before navigation is stopped. The vessels in this trade bring cargoes of iron ore back to American ports and then take coal on the outbound trip. The unprecedented demand for iron and iron ore makes the need for additional ore carriers acute; almost as much so as for more coal carriers. Also these vessels will bring grain down in addition to iron ore. There are numerous Canadian vessels that will engage in this trade if the present restrictions are removed during the war emergency.

"We need greater freedom in coastwise trade. Suppose for instance a British vessel discharged cargo at Norfolk and was ordered to Galveston for a cargo of cotton. Suppose also that there was need of coal at Galveston and this vessel could carry a considerable amount and had cargo offered. It could not take that cargo without subjecting itself to heavy penalties as matters now stand. As badly as coal is needed in New England for stocks the vessel could not proceed from Philadelphia to Boston with coal. It could not take lumber for shipyards, or anything else.

"The secretary of commerce has the right under the law to remit these heavy penalties and has been doing so in particular instances, but the shipping board thinks, and I heartily concur, that to have the coastwise penalties suspended generally will prove of considerable benefit."

Globe Line Enters South American Trade

The Globe Steamship line is entering the trade to South American ports. Hitherto its ships have been engaged for the most part as carriers to Italy, France and Portugal. Within the past month the first voyage on the new service to South America was made by the Norwegian steam ship SVERRE, 6000 tons, which carried a general cargo to Chilean ports. Gaston, Williams & Wigmore, Inc., are the parent firm of the Globe line.

At the present time the Globe line has seven ships either building or just completed. One of these, the auxiliary schooner SANTINO, of 4000 tons, has just been completed at Grays Harbor, Wash. The auxiliary schooner GRAYS HARBOR, 4000 tons, being built at Grays Harbor, Wash., will be finished in June. Another auxiliary schooner, the MOUNT RANIER, 4000 tons, building at Grays Harbor, will be finished early in July.

Two motor vessels are being built for the Globe line at Portland, Oreg., of 4000 tons each, to be ready in August, and finally the line has two steamers of 5000 tons each being built at Detroit. These are to be ready by September. With these vessels, and including the firm's chartered steamers and tonnage, the Globe line has now a fleet of 58,150 tons. The new schooners will be used for the Brazilian and Chilian trade and the other vessels for European traffic.

BALTIC No. 2, second of the big freighters built by the Slidell Drydock & Shipbuilding Co., at Slidell, La., is about ready for the sea. BALTIC No. 1, built by the same company, is somewhere on the Atlantic, cargo laden and bound for Europe, with Capt. C. Bing, of Christiania, on the bridge.

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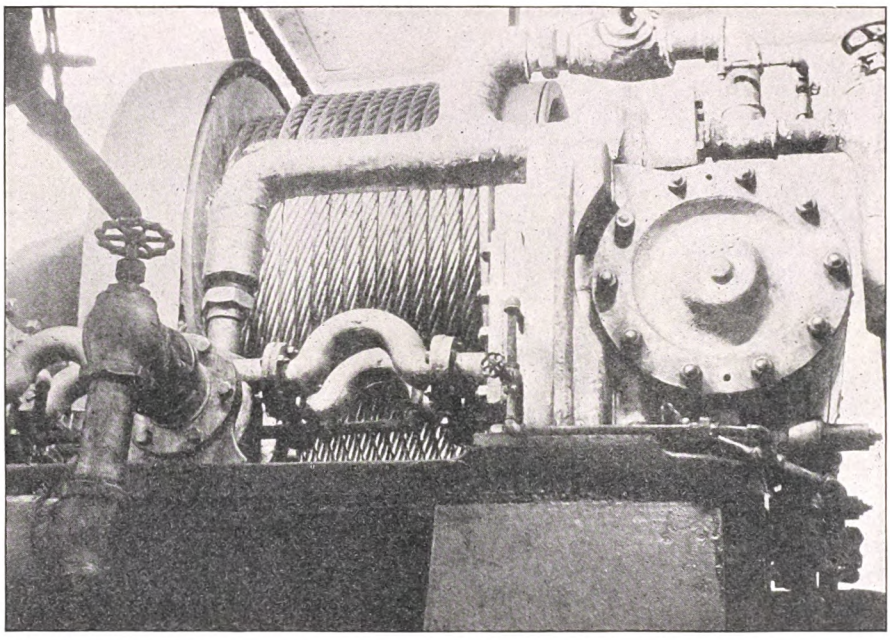
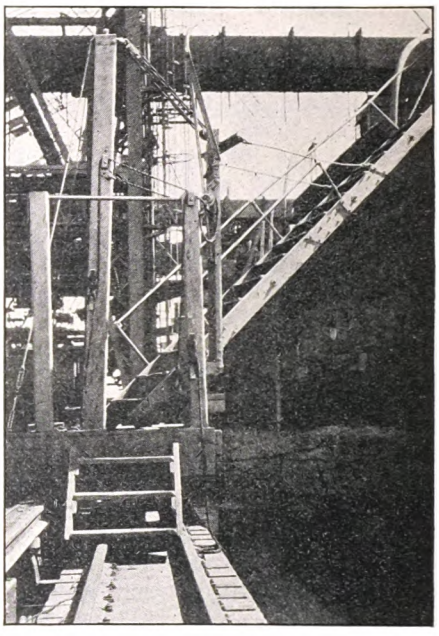
Latest Marine News in Pictures

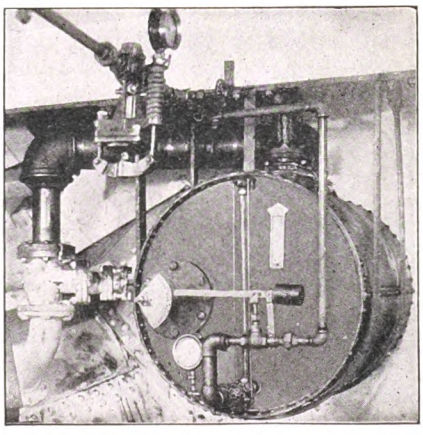
Payment Will Be Made For Acceptable Photographs



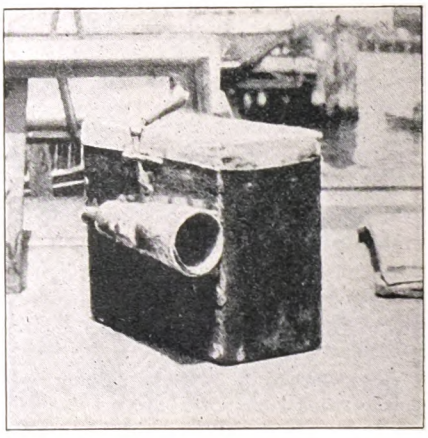
STEAM-DRIVEN AUTOMATIC TOWING GEAR USED ON PITTSBURGH STEAMSHIP CO.'S BARGES. THE ROPE ON THE WINDLASS IS WORTH APPROXIMATELY $500

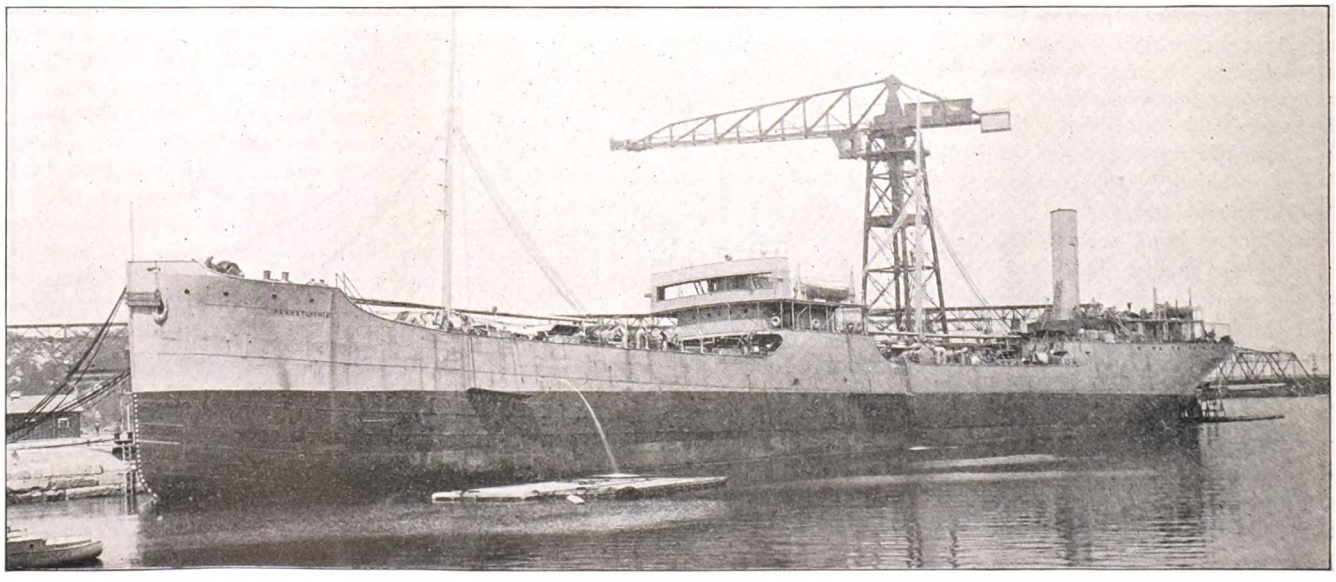


MOVABLE LADDER ON ORE UNLOADING DOCK, FAIRPORT, O. LADDER RUNS ON NARROW TRACK SHOWN IN FOREGROUND



THE ILLUSTRATION AT THE LEFT, SHOWING SEWAGE DISPOSAL DEVICE INSTALLED ON *D. G. KERR,* IS THE INVENTION OF LESLIE FRANK, OF THE FEDERAL HEALTH SERVICE—AT THE RIGHT IS AN OLD TYPE OF FOG HORN STILL USED BY SAILING VESSELS ON THE ATLANTIC COAST—THE HORN IS ABOUT 18 INCHES LONG AND IS OPERATED BY HAND-DRIVEN BELLOWS — THE ILLUSTRATION BELOW SHOWS THE NEW TANKER *PENNSYLVANIA,* BUILT BY THE FORE RIVER SHIPBUILDING CORP., QUINCY, MASS. —THIS NEW CRAFT HAS A DEADWEIGHT CAPACITY OF 9100 TONS





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Photographs From Far and Near

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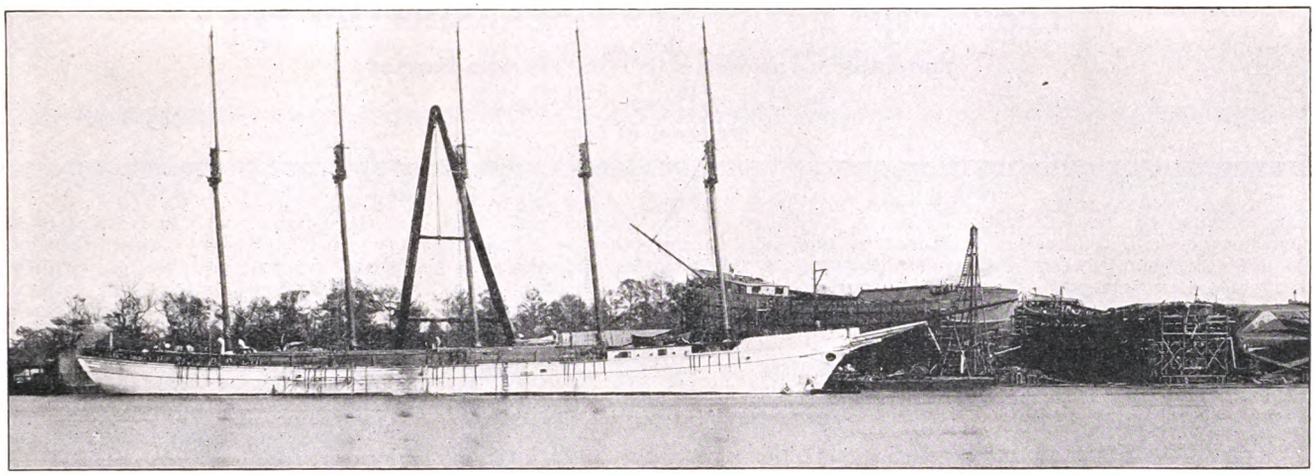
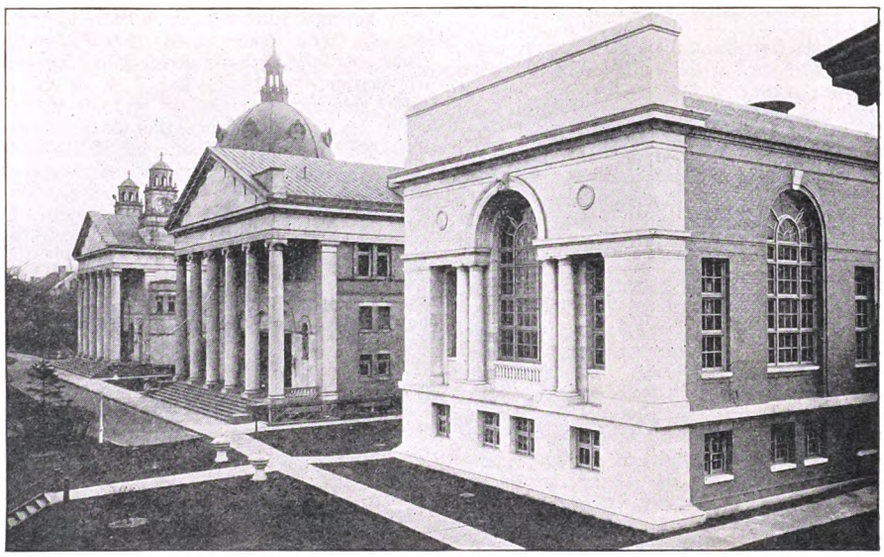


SHIPYARD AT ORANGE, TEX., AT WHICH A LARGE AUXILIARY HAS JUST BEEN LAUNCHED

SEAMEN'S HOTEL AND CHAPEL, STATEN ISLAND, N. Y.



SAILORS' HOME, STATEN ISLAND, N. Y., SHOWING, FROM LEFT TO RIGHT, CHURCH, MUSIC HALL, RECREATION BUILDING

TWO DIRECT-REVERSIBLE, 2-CYCLE DIESEL ENGINES DRIVE *PALISADES*, A HUDSON RIVER PLEASURE CRAFT—SHE WAS BUILT BY THE MATHIS YACHT BUILDING CO., CAMDEN, N. J.

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Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

The sinking of the LUSITANIA by a submarine resulted in litigation bringing into issue the point whether a passenger on the boat traveling to the London office of his employer could recover on the ground that the sinking was an accident arising in the course of his employment within the workmen's compensation act. The court held in Foley vs. Howe Rubber Co., 99 *Atlantic Reporter* 624, that the sinking was such an accident, and said: "Foley's presence on the ship was connected with the very employment in which he was engaged. The fact that the LUSITANIA was lost through none of the common perils of the sea, but by an extraordinary peril, does not make the extraordinary peril less a cause of accident arising out of Foley's employment. Both Foley and his employer were chargeable with knowledge of the perils of war upon the high seas. They must be assumed to have known that a belligerent vessel, sailing under a belligerent flag, carrying contraband of war, subjected the vessel to attack by an enemy vessel, and that as a result of such attack, under many contingencies recognized by the law of nations, not only the loss of the vessel attacked, but the loss of lives of those upon her, might result. The fact that the attack in this instance was not executed in a way that might have been anticipated, but in a manner said to be contrary to the law of nations, may operate to qualify the degree or nature of the danger and risk to such a peril, but does not eliminate the essential factor in the case that the voyage was one pregnant with risk which the employer must have contemplated, as arising out of and in the course of the employment."

* * *

The law relating to the discharge and taking off of pilots was in issue in the case of PHILADELPHIA, 239 *Federal Reporter* 396, and it was there held: (1) It is proper and usual to discharge the pilot from the lee side. (2) It is a proper and frequent practice for the pilot to decide from which side he will leave the ship and to make his arrangements accordingly. (3) It is proper and the usual practice, in discharging pilots, for the vessel having the pilot aboard to lay to and stay stopped, making in so doing the side from which the pilot has arranged to leave the lee side. (4) It is proper and customary for the pilot boat, to do whatever maneuvering is necessary to take off the pilot, and for the other vessel to stay stopped and do nothing. (5) It is a proper and frequent course for the pilot boat, if under steam when she approaches the other vessel on the weather side, to go astern and round to on the lee side. There is nothing, however, improper in the pilot boat coming to on either side of the other vessel. Whether she comes to one side or the other is wholly a matter of convenience, and to facilitate reaching the side of the other vessel in a skiff or yawl to take off the pilot.

* * *

Congress has the right, according to the decision in the case of IXION, 237 *Federal Reporter* 142, to prescribe rules which shall govern a vessel and sailors while within the jurisdiction of the United States. In this case it appeared that libelant was an alien seaman and that he entered into shipping articles in a foreign jurisdiction, with a foreign vessel. The court held that Revised Statutes, § 4530, as amended by the act of March 4, 1915, c. 153, § 4, 38 Stat. 1165, relating to right of seamen to receive on demand from the master one-half of the wages which he shall have earned, at every port where the vessel shall load or deliver cargo, and providing that it should apply to seamen on foreign vessels while in harbors of the United States, was applicable to libelant. This same statute was involved in the case of In re IVERTSEN, 237 *Federal Reporter* 498, and the court decided that deducting previous advances, a seaman is entitled at each port to receive one-half of the balance of any wages earned and remaining unpaid at the date of demand; also, that demand and refusal are necessary to put the master in default.

* * *

The steam schooner ADELINE SMITH, was held, in the case of Albion Lumber Co. vs. Inter-Ocean Transportation Co., 240 Federal Reporter 1017, not to have converted the cargo of a disabled vessel to which, in response to signals of distress, she passed a line, and which she commenced to tow. It appeared that the managers of the disabled vessel, being apprised of her condition by wireless, sent a tug to take charge of her and her cargo, and that the master of the ADELINE SMITH refused to surrender possession. Subsequently, through no fault of th: ADELINE SMITH, the hawser parted, the disabled vessel drifted ashore and the cargo was totally lost. The court said that in view of the fact that the master and crew of the disabled vessel were at all times in full control of her and that they could have at any time cast off the line, mere refusal of the ADELINE SMITH to cast off her line did not constitute a conversion of the cargo, creating liability for its loss.

* * *

The District Court, Eastern District, South Carolina, in commenting on seamen engaged in salving service, in the case of Rivers vs. Lockwood, 239 Federal Reporter 380, said: "Sailors of the class of most of these libelants are a very ignorant and helpless class. They are wage-earners who in most cases are very much afraid of losing their job and wages, and are fit for no other employment, and under the dominion and compulsion of the officers under whose orders and in subjection to whose commands they habituallly serve, are therefore likely to yield to their wishes in this respect. They have been termed the wards of the court of admiralty, and the meaning of this is that they are recognized as being so helpless and incapable from their generally ignorant and impoverished condition, and the floating character of their life, which leaves them seldom long in one place, and so unable to protect themselves, as the court of admiralty takes somewhat the same charge of them as the court of chancery does of infants, or as it did of married women."

* * *

Jamison vs. New York & Porto Rico Steamship Co., 241 Federal Reporter 389, holds that notice of claim for damage to a cargo given after the cargo was unloaded into lighters, but before they were removed from the ship's side, were in time, within a bill of lading requiring notice to be given before the goods are removed from the ship's dock.

* * *

A question of fact arose in the case of the MINA, 241 Federal Reporter 530, as to whether the MINA or the ATTUALITA was in fault for a collision between them occurring in the Mediterranean sea in a dense fog. Each vessel claimed to have been virtually at a standstill, and that the other was running at a high rate of speed. The court decided in favor of the MINA, and said: "The mission of the ATTUALITA was in connection with the war, which called for expedition, and as little notoriety as to her movements as possible; and her navigators gave evidence of apprehension of danger from submarines and other methods of destruction, which made it more than probable while in the war zone, upon encountering fog, that she would have paid but little attention to the same, and have made time while her presence could not be observed."

R. T. Green, for 40 years a shipbuilder of Boston, died recently after a short illness, aged 64. At one time he owned vessels engaged in trade with Haiti. His building and repair yards is located at Chelsea, Mass.

Wooden shipbuilders of the Pacific northwest have organized for mutual benefit and for the purpose of cooperating with the government in wooden construction. The officers are: L. H. Griffiths, president; Joseph A. Sloan, vice president; Louis Williams, secretary; George Olson, treasurer.

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American Ship Yard Activities

A Snappy Summary of the Leading Events of the Month in the Vessel Construction Field

New Texas Yard Being Built Rapidly

THE new plant of the Beaumont Shipbuilding & Dry Dock Co., Beaumont, Tex., is now under construction and much progress has been made. C. O. Yoakum, vice president and general manager of the new company, states that a number of contracts already have been executed, including one for four standard wooden steamships for the United States Shipping Board Emergency Fleet Corp. It is expected the first keel for the government vessels will be laid about Aug. 1. The new plant is located between the Neches river and Brakes Bayou, in the city of Beaumont. A portion of the property also extends to the Kirby canal, connecting the river with the bayou. The property therefore, due to a bend in the river, is surrounded by water on all sides.

As shown by the accompanying plan, eight building slips have been laid out. In arranging the plant, the natural advantages of the site have been cleverly taken advantage of. The mill and mold loft is in the center of the property convenient to both sets of building slips. The material yard is also centrally located and a simple arrangement of tracks connects the slips with the mill and material yard. Each set of building ways is served by two derricks which swing through a complete circle.

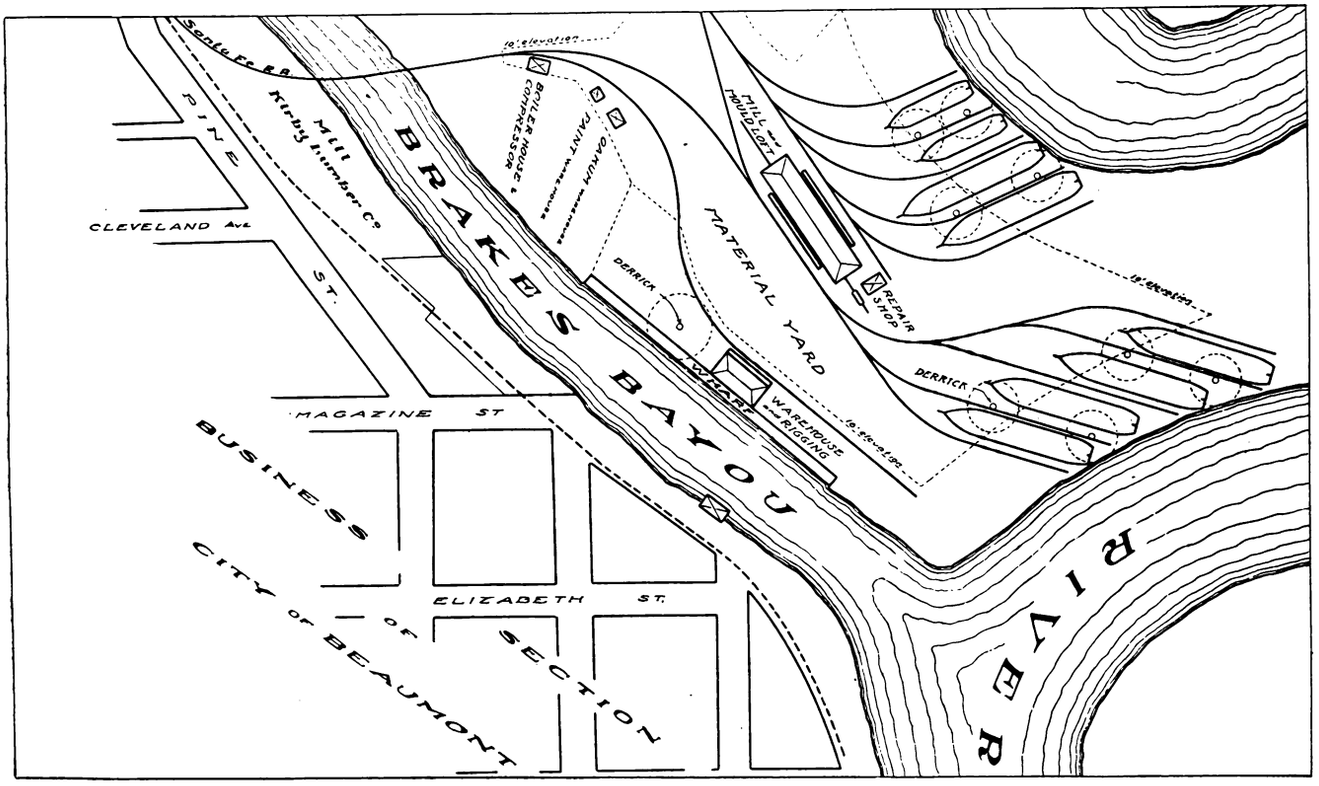
German Shipping Halved

Germany will emerge from the war with a net loss of more than 50 per cent of her merchant ships, according to figures recently compiled in Washington. Approximately 2,259,000 tons have been lost through mines, torpedoes, capture, and seizure. Should Argentine and other Latin American countries which have not severed relations with Germany decide to seize German vessels in their harbors, the loss to the German mercantile marine would be increased by 676,000 tons.

Experts, basing their opinion upon reliable statistics and upon official knowledge of the state of the ship building industry in Germany since the commencement of the war, assert that Germany will be unable for many years to resume her place in the commercial world. The United States has the opportunity of emerging from the war second only to Great Britain, and the very necessity of this country's participation in the conflict may compel America to take that place.

Germany's merchant shipping, based upon the tonnage and number at the beginning of the war, and upon losses since, is disposed of as follows: Lost by mines or torpedoes, 152 vessels, representing a tonnage of 452,000, retained or captured by enemies, 267, with a total tonnage of 807,000; in the United States and neutral harbors, 621, with a total tonnage of 2,341,000; in home ports, 400, or 2,419,000 tons.

Reckoned in percentages, Germany has lost through destruction from mines or



MAP SHOWING GENERAL ARRANGEMENT OF YARD OF BEAUMONT SHIP BUILDING & DRY DOCK CO

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torpedoes 7.1 per cent of her merchant ships; 14.1 per cent are held by the enemy and are being made the most complete use of; 43 per cent are in the ports of the United States, Cuba, Panama, and neutral countries, and 35.8 per cent are still at home.

American consuls who have come here from Germany reported that the stories of tremendous activity in German ship yards have been exaggerated. They asserted that the ship building industry in Germany, so far as merchant vessels are concerned, has been stagnant since the first year of the war. There have appeared in many German newspapers and trade journals, they said, very optimistic accounts of the tonnage being turned out from German yards, but these accounts mostly represent what was desired to be done and what was projected rather than what was actually being accomplished.

Facing the prospect, a wholly inadequate amount of tonnage presents to her as a post-bellum problem, Germany is confronted also by the cold fact that English ship yards are working at capacity on merchant bottoms and are turning out vessels at the rate of 1,000,000 tons a year. The American yards have not yet reached capacity, but when they do, and it is hoped they will within a very few months, they are expected to match the output which has been attained by the British.

British Admiralty Orders Paddle Tugs

THE Woolston Shipbuilding establishment of Messrs. John I. Thornycroft & Co., England, built two paddle tugs to the order of the British admiralty, and are now in service at the Sheerness dockyard. As the conditions in which these vessels are required to operate are somewhat exceptional, the paddle has been preferred to the screw system. At Sheerness the tide runs at springs up to as much as 3¼ knots, and, not only are the largest dreadnoughts to be moved, but there is a limited amount of room in which to maneuver, for there is a line of moorings up each side of the river with a minimum intervening space. It is mainly for these reasons, and in view of the fact that the duty lies in enclosed waters and that the tugs in question will not be required for ocean-going work, that the paddle has been preferred to the screw tug, as it has been found that the former obtains immediately a more solid grip of the water and there is considerable slip with a screw propeller when there is no way on. These two tugs, named the Sturdy and Strenuous, are of the same general design and dimensions, the measurements being as follows:

Length between perpendiculars, 145 feet; breadth, molded, 28 feet; depth, molded, 15 feet; draught, extreme, 11 feet; speed, 12¼ knots.

The bridge deck extends about 50 feet forward and aft and right across the paddle-boxes, and here are situated the wheel and chart house, the wheel being connected to the bow McLachland steam steering gear on the main deck just forward of the engines. On each side of the bridge is a pair of Chadburn improved telegraphs, as fitted to so many British warships. In these Chadburn instruments the lever is in the form of a crank handle, one complete revolution of which is required for each separate order. For instance, to go full ahead, three revolutions of the crank handle in the ahead direction are required; thus the motion is an easy one for the body. The ahead movement is the natural one if the boat is required to go ahead, and, furthermore, there is no question of looking at the dial to see if the pointer is resting at "half" or "full" or between the two; the complete revolution makes it quite definite. To go astern, the crank handle has to be brought round backwards, again the natural movement. The only objection which can be offered to such an arrangement is that seven turns have to be made for full ahead to full astern, so that it is a little slower than the ordinary form.

However, as when steaming about 10 knots against a tide of 1¼ knots, the ship stops in very little more than her own length from the time the telegraph is first moved; there is probably not much in this. At each end of the dial is an additional space "couple" and "uncouple", so that when settled down for a long tow the two pairs of engines may be connected together, and when so connected only one telegraph is used. The connection from the bridge to the engine room is by shafts and bevel wheels, and, as there are no chains, the gearing will outlast the ship herself as far as wear and tear are concerned. The arrangement of the boiler aft of the engines necessitates the towing hook being placed rather further aft than is generally the case with a screw tug. On the foremast is fitted a big derrick capable of lifting 5 tons, the power being obtained from the Clarke-Chapman steam winch forward. Aft, again, there is a steam capstan for handling heavy tow ropes and for warping. Forward under the main deck are the crew's quarters, 40 men being berthed on lockers and in hammocks, the officers having separate cabins aft.

The machinery consists of two sets of diagonal compound condensing engines with cylinders 22 inches and 40 inches diameter by 60-inch stroke, and giving a combined horsepower of approximately 1,250. Each pair of engines forms a complete unit, with its own independent condenser and air circulating and feed pumps. The two shafts can, however, both be connected together by a dog clutch, which can be inserted, even when the engines are running at full speed of 40 revolutions per minute by means of a hand wheel and screw. This engagement is effected at speed without the least difficulty. When in the river and maneuvering the engines work independently, but when at sea they always work together to prevent racing. There is a very close equality in the horsepower developed by each pair of engines, the difference being considerably less than 1 per cent, though there has been a good deal of difference between the high-pressure and low-pressure cylinders in each case. Ordinary double link gear is fitted, each set of gear having its own two-cylinder "all-round" reversing engine, the connection between the way shaft and the reversing engine being worm gearing. The two cylinders form a very quick acting and positive reversing gear. The main engines have piston valves on the high-pressure cylinders and flat trick valves with relief frames on the low-pressure cylinders. The framework of the main engine is of somewhat unusual form, the only castings being comparatively small parts for the main bearings, and these are of mild steel, the rest of the framework being entirely of forged steel. The columns are used as crosshead guides, being squared for the purpose, the central one taking one of the slippers of each of the cylinders. For this purpose it is, of course, widened out on the surface, but is grooved out along the sides in order to save weight. The water service is on an elaborate scale and is supplied from tanks filled by a branch from the fire main. Fine save-alls are fitted under the cranks and guides, which should lead to an economy in oil and contribute to a cleanly engine room. There are two big fire and salvage pumps delivering 120 tons per hour each below deck, and, of course, the usual filters, feed heaters, etc., to-

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gether with a Brotherhood enclosed engine driving a dynamo for lighting the ship. Two single-ended three-furnace boilers working under natural draft, with Morrison suspension furnaces, are fitted, and arrangements are made for supplying steam overside for salvage purposes. As far as possible steel was used for the steam pipes throughout. The fuel consumption on the official trial trip was 2 pounds per indicated horsepower per hour at full power.

Anyox Launched

The steamer ANYOX, which was built at the yards of the Winslow Marine Railway & Shipbuilding Co., Winslow, Wash., for the Coastwise Steamship & Barge Co., Seattle, was launched on Aug. 2. The ANYOX is a wooden steamer and will be used for carrying ore. Mrs. James Griffiths was sponsor.

The ANYOX is 205 feet 6 inches in length over all with a molded beam 38 feet 8½ inches and a molded depth of 23 feet 4 inches, designed for a deadweight carrying capacity of 1280 tons. She will be driven by a triple expansion engine of 1000 indicated horsepower, operating a single screw. The engine will run 120 revolutions per minute, with steam at a working pressure of 180 pounds per square inch.

A feature in the construction of the ANYOX is the provision for two continuous longitudinal bulkheads, extending from the floors to the main deck on each side in line with the fore-and-aft hatch combings. As soon as the ANYOX is finished a more detailed illustrated description of her will be published in THE MARINE REVIEW.

Few Steel Ships in Canada

According to a statement by Mark Workman, president of the Dominion Steel Corp., Montreal, Que., Canada, will not be in a position to build steel ships for two or three years, owing to the scarcity of steel. He said that the entire output of the steel from the plant of the Dominion Steel Corp. has been contracted for by the imperial munitions board up to the middle of 1918, and the chances are that this contract will now run into 1919. He stated that it would be an impossibility for his corporation to operate a plate mill at the present time, even if they had one on the ground, because of inability to secure raw materials. The corporation has a rail mill lying idle because sufficient steel cannot be obtained to operate it. The Canadian government railways, the Canadian Pacific and the Grand Trunk railways, all want rails, but shell requirements exhaust Canada's steel production. The corporation this year is spending about $5,000,000 on extensions and improvements at Sydney, N. S., but this increased output is all provided for in contracts made with the imperial munitions board.

Dutch Shipbuilding Expands

The expansion of the Dutch ship building industry within the last two years is shown by the following table, which gives the tonnage under construction in Dutch yards in December over a period of several years:

	Tons.
December, 1901	33,700
December, 1911	128,400
December, 1912	158,050
December, 1913	172,000
December, 1914	185,170
December, 1915	406,045
December, 1916	439,810

The total of 439,810 tons in course of construction on Dec. 31, 1916, included 65,545 tons for foreign account, as follows:

	Tons.
Norwegian	43,580
Danish	13,140
Swedish	6,475
Spanish	2,100
Greek	250

The remainder of the tonnage has been ordered by Dutch owners, but much of this has meanwhile been sold to other neutral owners.

Tonnage building in foreign yards for Dutch account comprises the following:

	Tons gross.
December, 1901	37,400
December, 1911	127,000
December, 1912	153,150
December, 1913	103,000
December, 1914	74,500
December, 1915	85,700
December, 1916	74,000

The Sandy Point Shipbuilding Co., Belfast, Me., with a capital of $250,000, has been incorporated by Union S. Adams, Townsend, Mass., Howard B. Capen, Stockton Springs, Me., Elon B. Gilchrist, Belfast, Me., Paul E. Atkinson, Milton, Me. The company plans to build steel ships and vessels, drydocks and marine railways.

The steamer WAR MONARCH, a 12,000-ton vessel, building for the Cunard line, was launched at the Alameda, Cal., yards of the Union Iron Works recently. The WAR KNIGHT, of 10,000 tons, has just been completed. The Union Iron Works has contracts from the Cunard line for the construction of eight 12,000-ton steamers, and the WAR BARON, the first of this lot, will be launched in July. The Moore & Scott Iron Works have contracts for three 9400-ton vessels for the same line. Altogether this one line has contracted at various coast yards for the construction of 33 modern steamers, ranging from 7500 to 12,000 tons.

New Moore & Scott Co.

Important changes recently have taken place in the ownership of the Moore & Scott Iron Works, shipbuilders, San Francisco. The interests of Henry T. Scott and John P. Scott, who have been affiliated with this concern for a great many years, have been purchased by the Moore family. Albert Moore is president of the new company and capital has been secured whereby extensive enlargements will be made. Moore & Scott Iron Works operate one of the largest shipbuilding and machinery construction establishments on the Pacific coast. An order recently was received from the United States Shipping Board Emergency Fleet Corp. for 16 large steel freight steamships. This is in addition to considerable work for private owners now under way in the Moore & Scott yards.

Builds Largest Boat

On Aug. 2, the largest steel freighter ever built at Toronto, Ont., was launched at the yards of the Thor Iron Works. The vessel is of 4300 tons capacity, 261 feet long, 43 feet beam, and 28 feet 3 inches molded depth, equipped with a triple expansion engine of 1400 horsepower. She was built for the Oriental Navigation Co., Nantes, France, and was named the ORLEANS.

On the same day, two fishery protection steamers were launched at the yards of the Polson Iron Works. They are part of a fleet of six sister ships, which were described in THE MARINE REVIEW, August, 1917. The new boats were named the ST. ELOI and the FESTUBERT.

A charter was issued in Delaware recently incorporating the Great Eastern Shipbuilding Co., New York. It is capitalized at $30,000,000 and is authorized to build and operate boats and drydocks.

The International Shipbuilding Corp., Sydney, N. S., which is erecting a plant at Newcastle, N. B., to cost $2,000,000, has taken over the plant and business of the Sydney Foundry Co., at Sydney, and will greatly extend the business of the company. New machinery for manufacturing marine engines, winches, etc., will be installed. The company has also purchased a small floating drydock at Halifax, N. S., which will be towed around to Sydney, to be used in the

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work of ship repairing. Extensive contracts for the constructing of marine engines have already been placed with the company by the admiralty, as well as for repairing of a number of vessels. The company proposes eventually to proceed with the building of a large graving dock where the largest ocean liners can be repaired. It is the intention of the company to engage in steel shipbuilding on an extensive scale.

To Build Wooden Boats

Perew & Michaelson have just closed a contract with the United States Emergency Fleet Corp. for the construction of six wooden steamers, to be built on the Potomac river about 25 miles from Washington. It is stated the yard will be ready for work in 30 days and that the first of the ships must be complete in nine months. After that, one will be turned out every month. The vessels will be of the standard Ferris design. The firm of Perew & Michaelson is headed by Capt. Philip Perew, of North Tonawanda, N. Y. Captain Perew has been building and sailing ships on the Great Lakes for a number of years.

The J. F. Coleman Engineering Co., 921 Hibernia building, New Orleans, recently has been doing some special work in promoting the development of the wooden shipbuilding industry along the gulf. This company has been investigating the situation at Mobile in behalf of a client, who is considering entering the shipbuilding field of the south. Options have been secured on certain properties. The proposed site also has been surveyed. The principals in the transaction are now considering the final details.

The Benicia Shipbuilding Co., which recently purchased the Robertson yards at Benicia, Cal., has just incorporated with a capital stock of $500,000. The directors are H. R. White, R. C. Forester, R. L. McWilliams, Howard Finn and H. H. Phelger. The company is building two steamers for the Standard Oil Co. and one for A. F. Mahoney.

Work has been started on laying the keel of the first two 3500-ton steel steamships at the plant of the Tampa Shipbuilding & Engineering Co., Tampa, Fla. President Ernest Kreher states that when the work on the frame of this steamer is under way several weeks the keel of the second steamer will be laid.

Climbing Up the Ladder

As the lake season is now well advanced and the men are pretty well settled into fixed berths, the time is opportune for printing the positions now occupied by the men who attended last winter's schools at Cleveland and other ports. It is interesting to note that 20 who were oiling in 1916 are now engineers, and it may be added that of those in the following list who were engineers last year, every one is on a larger vessel this season. Following is the list, with positions held on July 1:

Rating in 1916.		Position in 1917.
Anderson, E. L.	Oiler	Second Asst. Stmr. Crete.
Baker, J. R.	Oiler	Third Asst. Stmr. E. W. Pargny.
Bechhold, H. B.	Oiler	Second Asst. Stmr. Philip Minch.
Brewer, F. W.	Oiler	Third Asst. Stmr. P. A. B. Widener.
Brown, C. R.	Oiler	Second Asst. Stmr. E. J. Buffington.
Brown, M. P.	Oiler	Second Asst. Stmr. Richard Trimble.
Brown, W. J.	Oiler	Third Asst. Stmr. Geo. F. Baker.
Dickerson, H. G.	1st Asst.	First Asst. Stmr. W. L. Smith.
Donner, Joseph	Oiler	Second Asst. Stmr. H. C. Frick.
Driver, I. L.	Oiler	Second Asst. Stmr. J. P. Reiss.
Dunbar, W.	Oiler	Second Asst. Stmr. E. C. Collins.
Drullard, C.	Oiler	Third Asst. Stmr. W. B. Schiller.
Emerson, H.	1st Asst.	First Asst. Stmr. Victory.
Hill, Wm. H.	Oiler	Second Asst. Stmr. W. B. Dickson.
Jess, A. W.	Handyman	Second Asst. Stmr. J. A. Campbell.
Kronberg, A. E.	2nd Asst.	First Asst. Stmr. A. A. Augustus.
McElroy, O. G.	Oiler	Second Asst. Stmr. F. Rockefeller.
Morgan, W. J.	Oiler	Second Asst. Maricopa.
Olansen, S.	Oiler	Second Asst. Stmr. C. S. Robinson.
O'Riley, M.	Oiler	Second Asst. package freighter.
Porkola, G.	Oiler	First Asst. Stmr. R. S. Warner.
Rugg, I. M.	Chief	Chief Engr. Stmr. Goudreau.
Savage, C. H.	1st Asst.	First Asst. Stmr. E. J. Buffington.
Sutherland, C. F.	Handyman	Second Asst. Stmr. E. J. Earling.
Telliard, A. E.	1st Asst.	First Asst. Stmr. Michigan.
Thorwaldsen, T.	Oiler	First Asst. Stmr. John Owen.
Urdahl, A.	Oiler	Second Asst. Stmr. W. J. Olcott.
Van Arman, C.	1st Asst.	First Asst. Stmr. Sir Henry Bessemer.
Vellekopp, A. E.	Oiler	Third Asst. Stmr. D. M. Clemson.

The following shows that the men who attended the School in Navigation last winter are also doing well:

Bamford, Frank	Mate Stmr. Munising.
Habish, Paul	Mate Stmr. J. J. Hill.
Giddings, E. H.	Master Bge. Richland Daisy.
Bowers, T. W.	Second Mate Stmr. A. E. Cornelius.
Waurzynicka, Geo.	Second Mate Stmr. Mariposa.
Howard, Jos.	Second Mate Stmr. E. L. Pierce.
Gay, Geo.	Second Mate Stmr. Sir H. Bessemer.
Hiller, John	Second Mate Stmr. E. N. Breitung.
Rushing, M.	Second Mate Stmr. Henry Cort.

Sailors Are Bond Buyers

According to reports that have reached the offices of the Lake Carriers' Association, the officers and men in the lake fleet subscribed liberally to the Liberty Loan. While actual figures are not available, it is known that they took several thousands of dollars' worth of the bonds and surpassed all expectation. Besides having shown a fine spirit of patriotism, the buyers have invested judiciously and will get good returns on their money.

Capt. James Richardson Raymond died recently at West Nutley, N. J., aged 72. He had devoted the past 25 years to developing life-saving equipment, of which his releasing device for life boats was the best known. He was an associate member of the Society of Naval Architects and Marine Engineers, as well as the Neptune association, Ship Masters' Club, Inc., of New York, and the Navy league of the United States.

Veteran Master Retires

The International Mercantile Marine Co. announces that Capt. John Clark Jamison, for many years the commodore of the American line fleet, has retired from active duty, having considerably passed the service age limit. He joined the American line in January, 1876, as second officer of the steamer PENNSYLVANIA, rising rapidly to a command in 1880. After congressional action in 1892, which transferred the British-built steamers CITY OF NEW YORK and CITY OF PARIS to American registry, Captain Jamison was in command on the historic occasion when President Harrison raised the Stars and Stripes on the CITY OF NEW YORK in New York harbor, Feb. 22, 1893. Since that time, Captain Jamison has been continuously in command of one of the American line's fast mail steamers, his latest service being aboard the ST. LOUIS. Captain Jamison was born in Brooklyn, where he has resided for many years.

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How Wooden Ships Are Built—IV

Details of Different Types of Wooden Vessels Are Presented in This Chapter—Steel Reinforcing is Popular

By H. Cole Estep

AFTER providing for the layout, equipment and organization of his plant, the wooden shipbuilder turns naturally to a consideration of the structural details of the various types of vessels he may be called upon to turn out. The successful builder is familar with all kinds of ships, and is broad minded enough to realize that valuable suggestions may be obtained from a study of even the so-called freak designs. He knows also that before he can go ahead with the details of his building operations, he must become thoroughly familiar with the general outlines of a large number of boats. It is logical, therefore, to insert a chapter at this point in our series which will set forth the salient facts regarding a number of different wooden ship models in such a manner that the reader may readily compare the various designs. This can best be done by presenting a number of detailed drawings, supplemented by such descriptive text as may be necessary. The drawings and reproductions of photographs, however, really tell the story and they should be studied carefully.

The Conventional Type

Fig. 5 in the first chapter in this series, published in the June issue of THE MARINE REVIEW, shows a cross section of a modern American wooden ship of the conventional type. This ship is 48 feet beam and about 275 feet in length. Her floors are 18 inches deep. The keel is 18 x 20 inches. The bottom planking is 4½ x 14 inches. The ceiling over the floors is 10 x 16 inches and over the bilges 12 x 12 inches. The backbone consists of nine keelsons 20 inches square surmounted by a 20 x 24-inch rider keelson. The keelson assembly is connected to the lower and upper deck beams by means of 14 x 14-inch stanchions. Both sets of deck beams are 14 x 16 inches in cross section. These few dimensions are presented to give an idea of the size of timbers used in the construction of vessels of this class.

This type of ship was developed and brought to a high state of perfection on the Pacific coast where it is employed principally in the lumber carrying trade. Experience has shown, however, that vessels of this general design—they are called steam schooners on the west coast—are not suited to long off-shore voyages or for carrying general cargo. Their hull construction is too shallow for one thing.

Furthermore, although the builders of these boats are exceedingly lavish in the use of timber, their strength is not all that could be desired. It has been found that when running light in heavy seas they have a tendency to hog. As a matter of fact, what really happens is that owing to their transverse weakness, the floors are bulged up from the bottom, sometimes seriously distorting the hull structure. The only way the old line builders have found to correct this tendency to hog or bulge is to use heavier ceiling and add more lumber to the hull structure. This, however, is hardly a logical method of attacking the problem.

Weakness Studied

The problem of overcoming the inherent weaknesses of wooden ship construction has been the object of close study by a large number of naval architects for a couple of years—ever since the revival in wooden shipbuilding set in in earnest. As a result of this intensive effort, a number of somewhat modified designs have been evolved, covering the construction of wooden vessels for deep sea service. The latest designs provide for boats up to 308 feet in length and of 4000 tons capacity. In some of them steel is employed extensively.

The question of using steel reinforcing in some form to counteract some of the characteristic weaknesses of wooden hulls is a moot one. Some builders, particularly of the older generation, claim it is not practicable to fasten wood and steel members together in a satisfactory manner. It is interesting to observe, however, that practically all of the larger

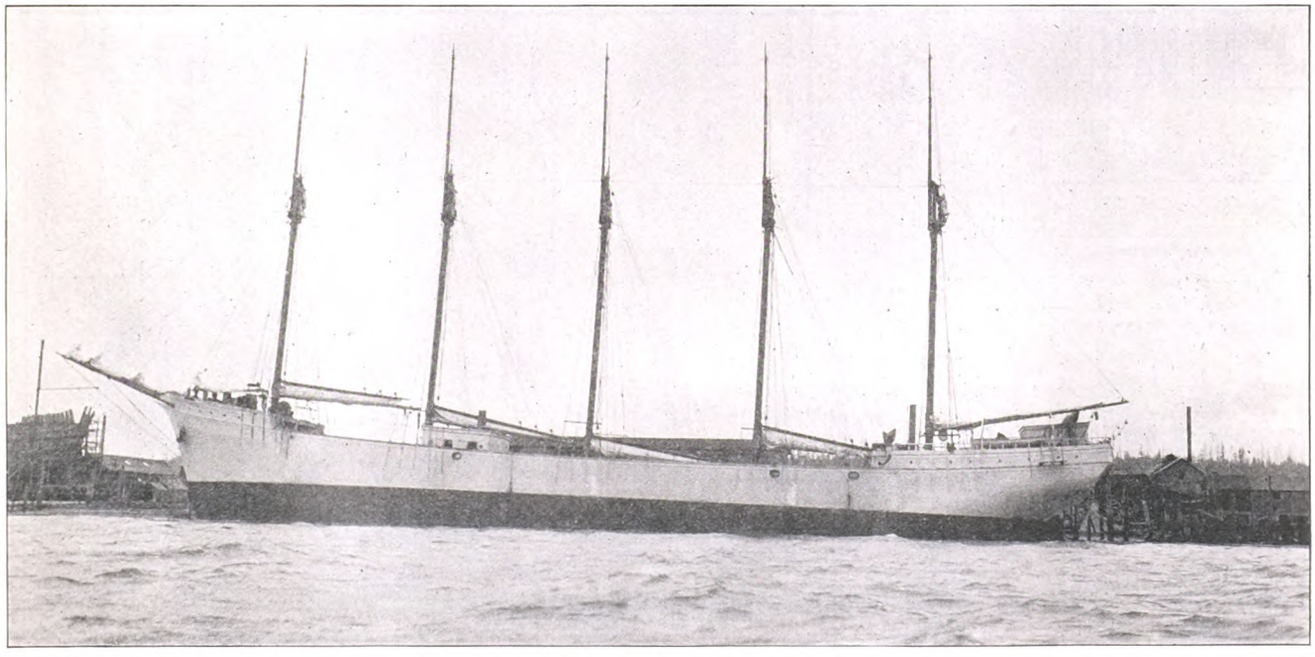

FIG. 35—A 5-MASTED, TOPMAST WOODEN AUXILIARY SCHOONER BUILT AT A PROMINENT PACIFIC COAST SHIPYARD

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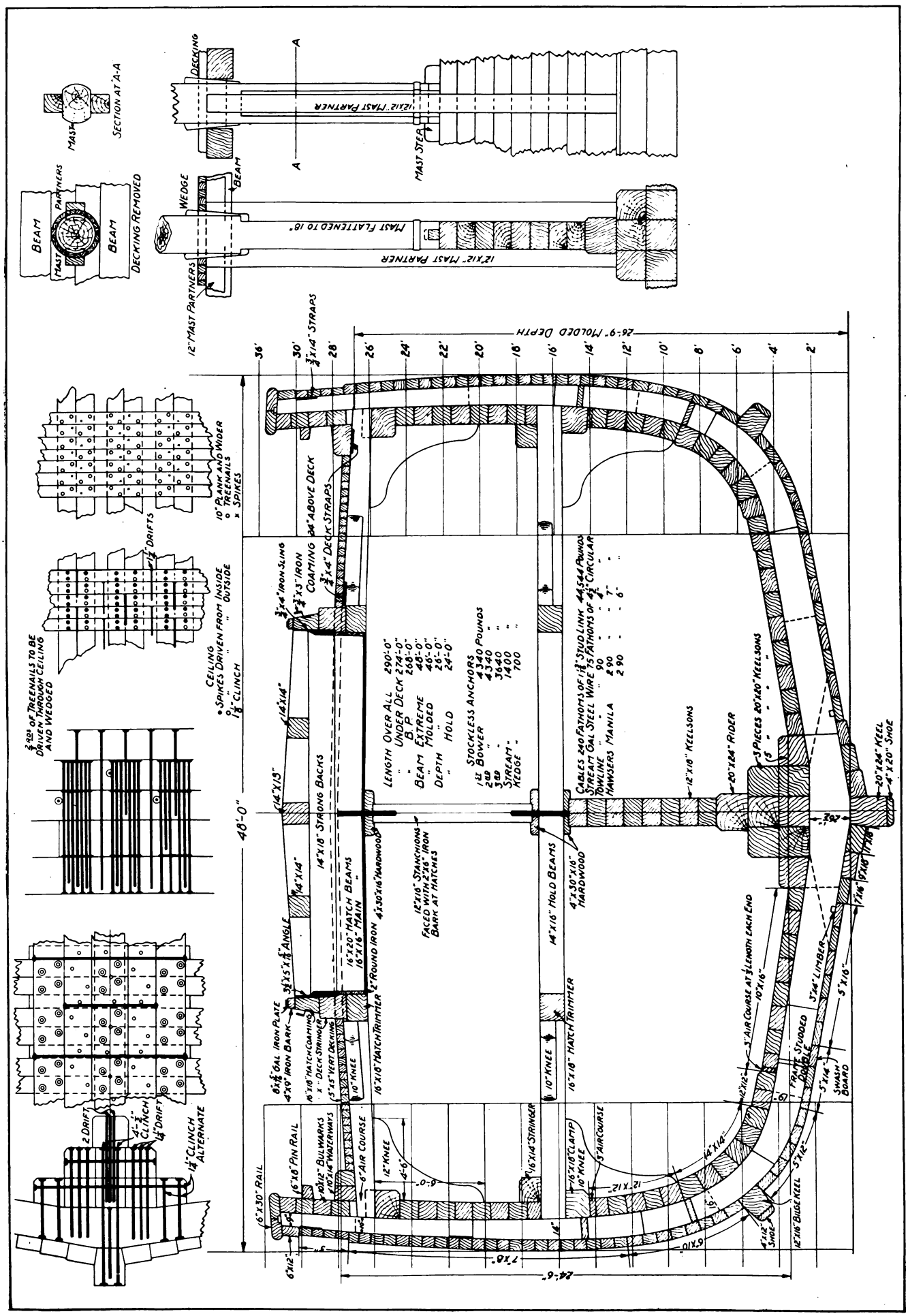

FIG. 36—MIDSHIP SECTION AND CONSTRUCTION DETAILS OF A 290-FOOT, 5-MASTED TOPMAST AUXILIARY SCHOONER

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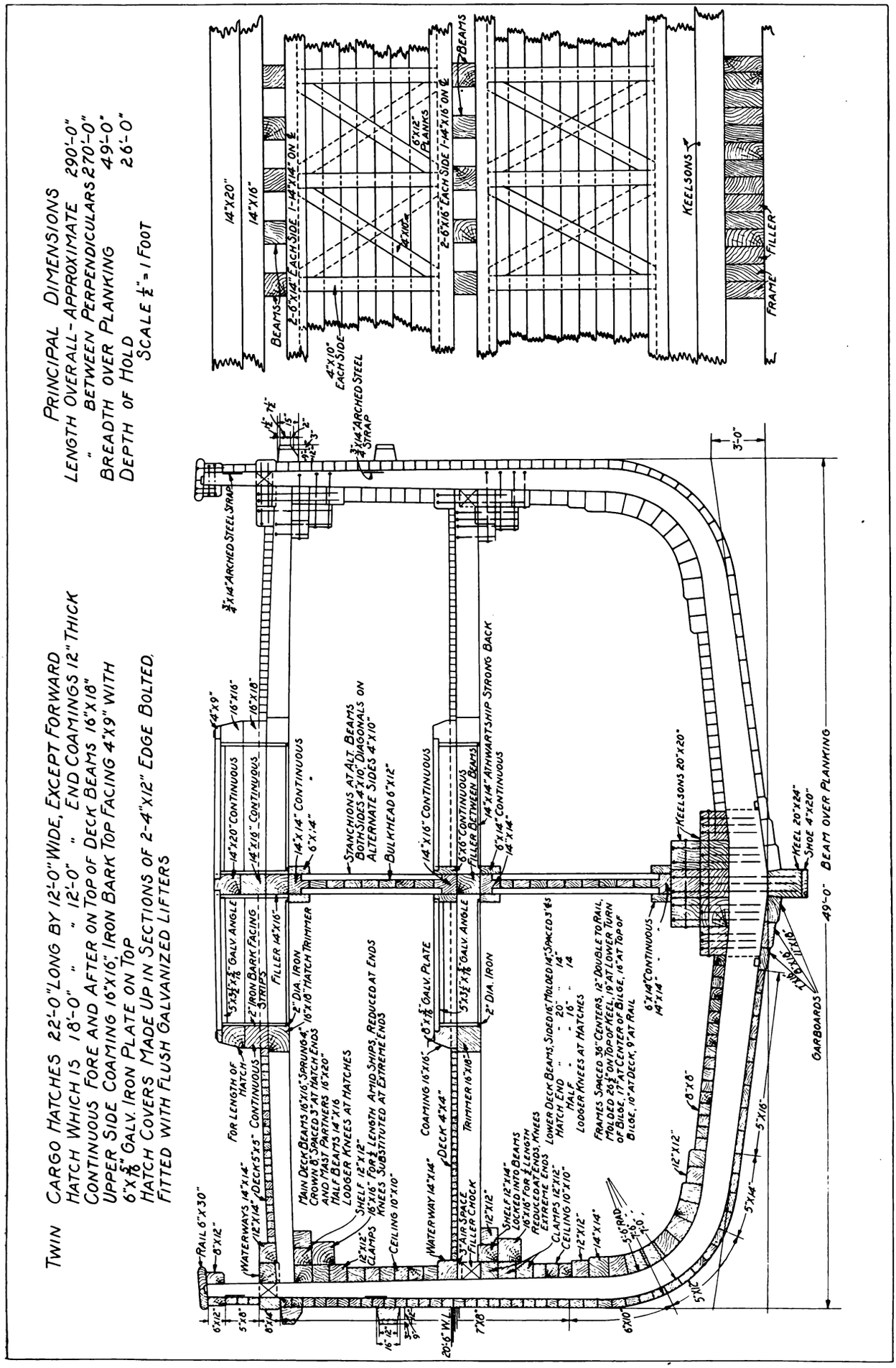

FIG. 37—MIDSHIP SECTION AND CONSTRUCTION DETAILS OF 4000-TON WOODEN STEAMER DESIGNED FOR CONSTRUCTION ON THE PACIFIC COAST

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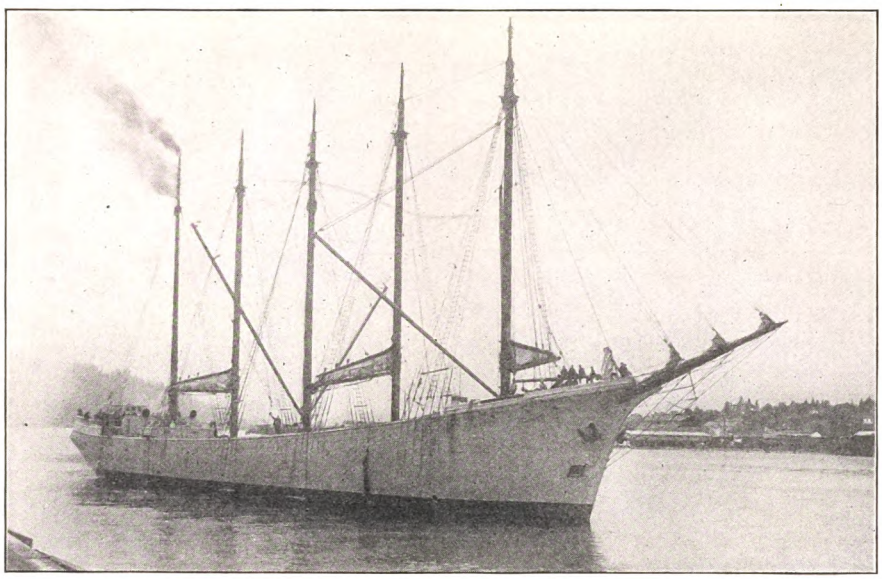

FIG. 38—A 5-MASTED WOODEN AUXILIARY SCHOONER UNDERGOING HER TRIAL TRIP

vessels under construction on the Pacific coast at the present time are reinforced with steel in one form or another. If current practice is any guide, it may safely be stated that steel reinforcement is necessary for hulls over 275 feet in length and exceeding, say, 3500 tons dead weight.

Various types of steel reinforcing are employed. In some cases, this consists simply of deck straps, with steel lined hatch combings. The deck straps usually are nothing more than flats ¾ inch thick and 4 inches wide riveted together at the ends.

The design worked out by Theodore E. Ferris for the standard wooden vessels for the United States Emergency Fleet Corp. provides for a system of diagonal steel strapping, somewhat similar to that illustrated in Fig. 6 in the June issue of THE MARINE REVIEW. The straps in the government boats are ½ x 4 inches in cross section and, of course, extend around and under the turn of the bilge. They are riveted at the top to ¾ x 8-inch steel chord. The straps are arranged in the form of a diagonal lattice and are riveted together where they cross. They are lined up to meet the top chord at every other frame space and are fastened to the frame timbers by 8-inch bolts. It is said this form of strapping for a 281-foot government boat costs $8000, including $5000 for labor. Two other forms of steel strapping are in general use on the Pacific coast at the present time. One style, designed by M. R. Ward, general manager, Grays Harbor Ship Building Co., Aberdeen, Wash., consists of two arches of ¾ x 14-inch universal plates let into the sides of the frames and securely bolted in place. The other type, designed by Fred A. Ballin, Supple & Ballin, Portland, Oreg., involves the construction of a steel bulwark or topside over the upper ends of the frame timbers. The steel topside construction is riveted to a deck stringer plate of suitable dimensions. The details of these two latter forms of strapping will be described later in this article.

Standard Designs

Modern designers, however, do not depend entirely on steel reinforcing for strengthening naturally weak wooden hulls. In the newer types of ships, the general arrangement of the hull structure has been materially modified and the distribution of timbers radically altered. The details of three types of modern Pacific coast construction are presented in Figs. 36, 37 and 40. A study of these three cross sections presents interesting contrasts. Before their details are taken up, however, it would be well to get clearly in mind the outward appearance and general arrangement of modern wooden vessels.

The outboard profiles and deck plans of three ships of standard type, therefore, are presented in Figs. 41, 42 and 43. These are all full-power boats. Auxiliary craft are shown in Figs. 35, 38, 39, 44 and 45. Fig. 44 shows the inboard profile of a typical 5-masted, 290-foot, topmast schooner, the general arrangement of which is indicated in Fig. 35.

The vessel shown in Fig. 41 is more or less like that designed for the United States Emergency Fleet Corp. It is of 4000 tons deadweight capacity, however, and is designed to burn oil fuel. This vessel is 265 feet in length, 43 beam and 26 feet deep. Power is derived from a triple expansion steam engine of about 1500 horsepower, placed amidships. It drives a single screw. The hull structure is divided by five watertight bulkheads arranged as shown in the outboard profile, Fig. 41. The cargo capacity of this vessel in cubic feet is as follows:

	Cubic feet
'Tween deck forward	27,600
Lower hold forward	66,800
'Tween deck aft	32,200
Lower hold aft	26,500
Main deck house	7,000
Total	160,100

A steel cargo boom for handling weights of the heavier character is provided forward.

A somewhat similar vessel, but more of the Great Lakes type, with the engines aft, is shown in Fig. 42. This ship, which is 300 feet long, 45 feet wide and 27 feet deep, has a deadweight capacity of 4500 tons. The machinery is practically a duplicate of that installed in the vessel shown in Fig. 41. In this case there are only four watertight bulkheads. Access to the main

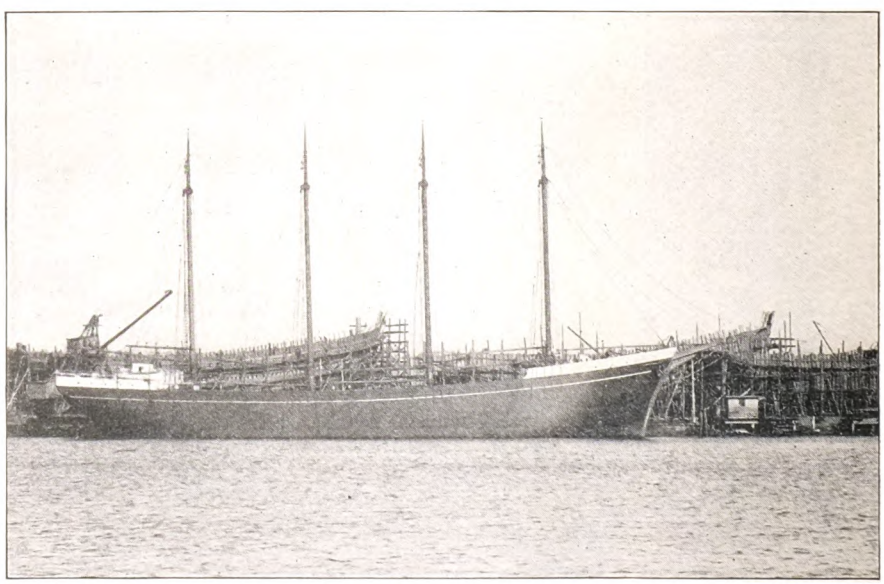

FIG. 39—THREE-THOUSAND TON, 4-MASTED SCHOONER BUILT AT SEATTLE, WASH.

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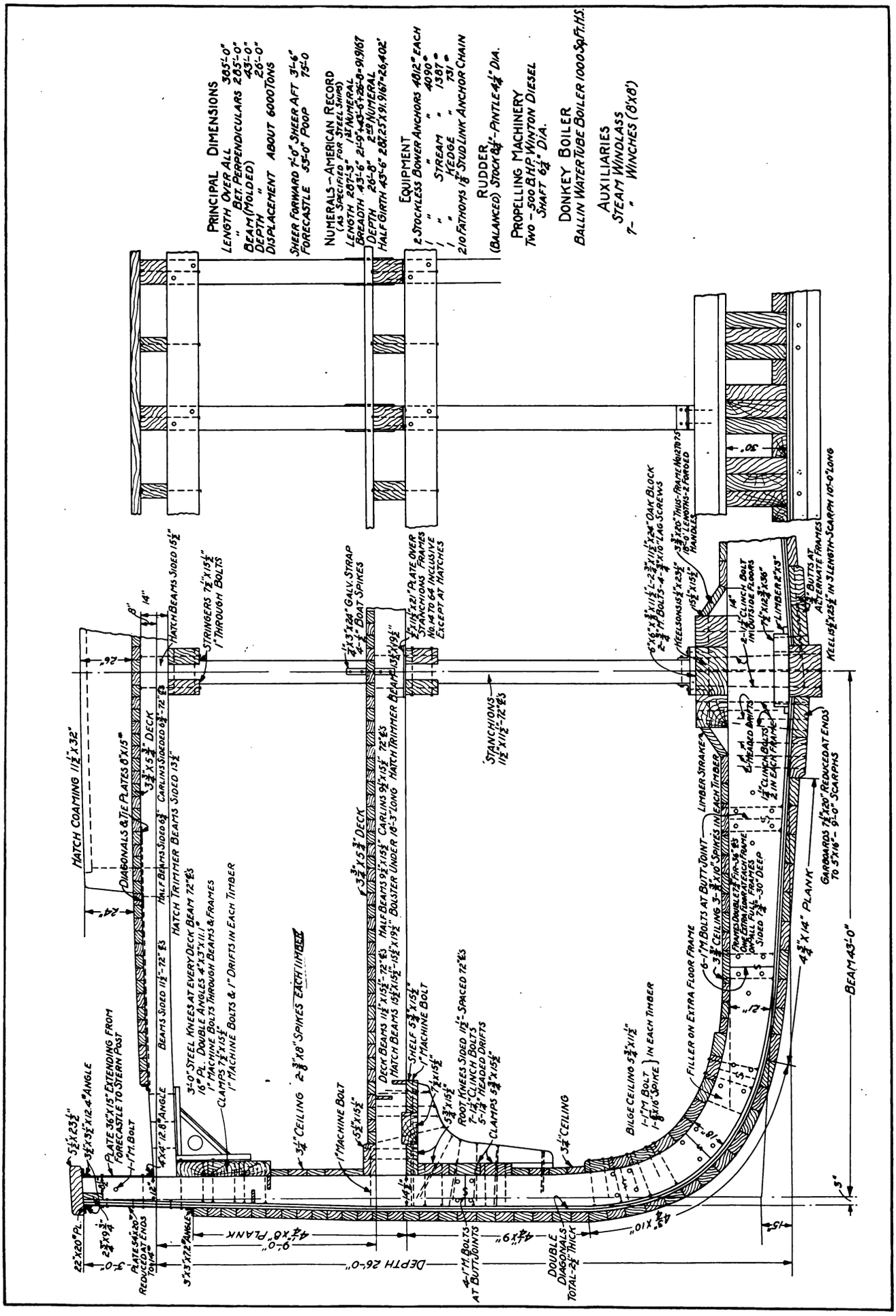
PRINCIPAL DIMENSIONS
LENGTH OVER ALL 385'-0"
" BET. PERPENDICULARS 365'-0"
BEAM (MOLDED) 43'-0"
DEPTH " 26'-0"
DISPLACEMENT ABOUT 6000 TONS
SHEER FORWARD 7'-0" SHEER AFT 3'-6"
FORECASTLE 35'-0" POOP 12'-0
NUMERALS - AMERICAN RECORD
(AS SPECIFIED FOR STEEL SHIPS)
LENGTH 267'-3" 1ST NUMERAL
BREADTH 43'-6" 2-9+43-6+26-0=91.967
DEPTH 26'-8" 2ND NUMERAL
HALF GIRTH 43'-6" 267.25X91.967=26,402'
EQUIPMENT
2 STOCKLESS BOWER ANCHORS 4812 LBS. EACH
1 " " STREAM " 4090 "
1 " " KEDGE " 1387 "
210 FATHOMS 1 1/8" STUD LINK ANCHOR CHAIN
RUDDER
(BALANCED) STOCK 8 1/2"-PINTLE 4 1/2" DIA.
PROPELLING MACHINERY
TWO - 500 B.H.P. WINTON DIESEL
SHAFT 6 1/2" DIA.
DONKEY BOILER
BALLIN WATER TUBE BOILER 1000 SQ. FT. H.S.
AUXILIARIES
STEAM WINDLASS
7- " WINCHES (8"X10")
HATCH COAMING 11 1/2" X 32"
DIAGONALS & TIE PLATES 8"X15"
3 1/2" X 5 1/2" DECK
HATCH TRIMMER BEAMS SIDED 15 1/2"
HALF BEAMS SIDED 8 1/2" CARLINS SIDED 8 1/2" @ 72"
BEAMS SIDED 11 1/2" @ 72"
STRINGERS 7 1/2" X 15 1/2" 1" THROUGH BOLTS
HATCH BEAMS SIDED 15 1/2"
3'-0" STEEL KNEES AT EVERY DECK BEAM 72" @
16" PL. DOUBLE ANGLES 4"X3"X11/16"
1" MACHINE BOLTS THROUGH BEAMS & FRAMES
CLAMPS 7 1/2" X 15 1/2"
1" MACHINE BOLTS & 1" DRIFTS IN EACH TIMBER
PLATE 36" X 15/16" EXTENDING FROM FORECASTLE TO STERN POST
1-1" M. BOLT
5 1/2" X 23 1/2"
3 1/2" X 3 1/2" X 12.4# ANGLE
4"X4"X12.8# ANGLE
3"X3"X12.2# ANGLE
22"X20" PL.
2 3/4" X 9 1/2"
PLATE 54"X20" REDUCED AT ENDS TO 1/4"
3 1/4" CEILING 2-7/8" X 8" SPIKES EACH TIMBER
1" MACHINE BOLT
5 1/2" X 15 1/2"
3 1/2" X 15 1/2" DECK
DECK BEAMS 11 1/2" X 15 1/2" @ 72"
HALF BEAMS 9 1/2" X 15 1/2" CARLINS 9 1/2" X 15 1/2" @ 72"
HATCH BEAMS 15 1/2" X 15 1/2" X 15 1/2" X 19 1/2" BOLSTER UNDER 18'-3" LONG HATCH TRIMMER BEAM
SHELF 5 1/2" X 15 1/2"
1" MACHINE BOLT
7 1/2" X 15 1/2"
5 1/2" X 15 1/2"
ROOT KNEES SIDED 11 1/2" SPACED 72" @
5-1 1/4" CLINCH BOLTS
5-1 1/4" HEADED DRIFTS
CLAMPS 5 1/2" X 15 1/2"
3 1/4" CEILING
BILGE CEILING 5 1/2" X 1 1/2"
1-1" M. BOLT
1-7/8" SPIKE
IN EACH TIMBER
FILLER ON EXTRA FLOOR FRAME
6-1" M. BOLTS AT BUTT JOINT
3 1/2" CEILING 3-7/8" X 10" SPIKES IN EACH TIMBER
FRAMES DOUBLED FIR 36" @
ONE EXTRA FRAME AT EACH FRAME
SMALL PLATE FRAMES
SIDED 7 1/2" - 30" DEEP
1 1/4" CLINCH BOLTS
2 IN EACH FRAME
LIMBER STRAKE
HEADED ENDS
STANCHIONS 11 1/2" X 11 1/2" - 72" @
5"X11"X21" PLATE OVER STANCHIONS FRAMES NO. 14 TO 64 INCLUSIVE EXCEPT AT HATCHES
2 1/2" X 13" X 26" GALV. STRAP
4 1/2" BOAT SPIKES
5"X16"X8 1/2"X11 1/2"-2 3/4" X 12" OAK BLOCK
2-3/4" M. BOLTS-4-9/16" X 10" LAG SCREWS
KEELSON 15 1/2" X 23 1/2"
3 3/4" X 20" THUS-PRATT NEVERSLIP
18'-0" LENGTHS-2 FORGED HANDLES
15 1/2" X 15 1/2"
14"
2-1" CLINCH BOLT IN OUTSIDE FLOORS
7 1/2" X 12 1/2" X 36"
LUMBER 13"
4 1/2" BUTTS AT ALTERNATE FRAMES
KEEL 15 1/2" X 23 1/2" IN 3 LENGTH SCARPH 10'-0" LONG
4 1/2" X 14" PLANK
GARBOARDS 7 1/2" X 20" REDUCED AT ENDS TO 5" X 16" - 9'-0" SCARPHS
BEAM 43'-0"
DEPTH 26'-0"
4 1/2" X 9"
4 1/2" X 10"
4 1/2" X 8" PLANK
9'-0"
4-1" M. BOLTS AT BUTTJOINTS
DOUBLE DIAGONALS TOTAL-2 1/2" THICK

FIG. 40—MIDSHIP SECTION AND CONSTRUCTION DETAILS OF A 4000-TON MOTOR SHIP WITH DIAGONAL PLANKING

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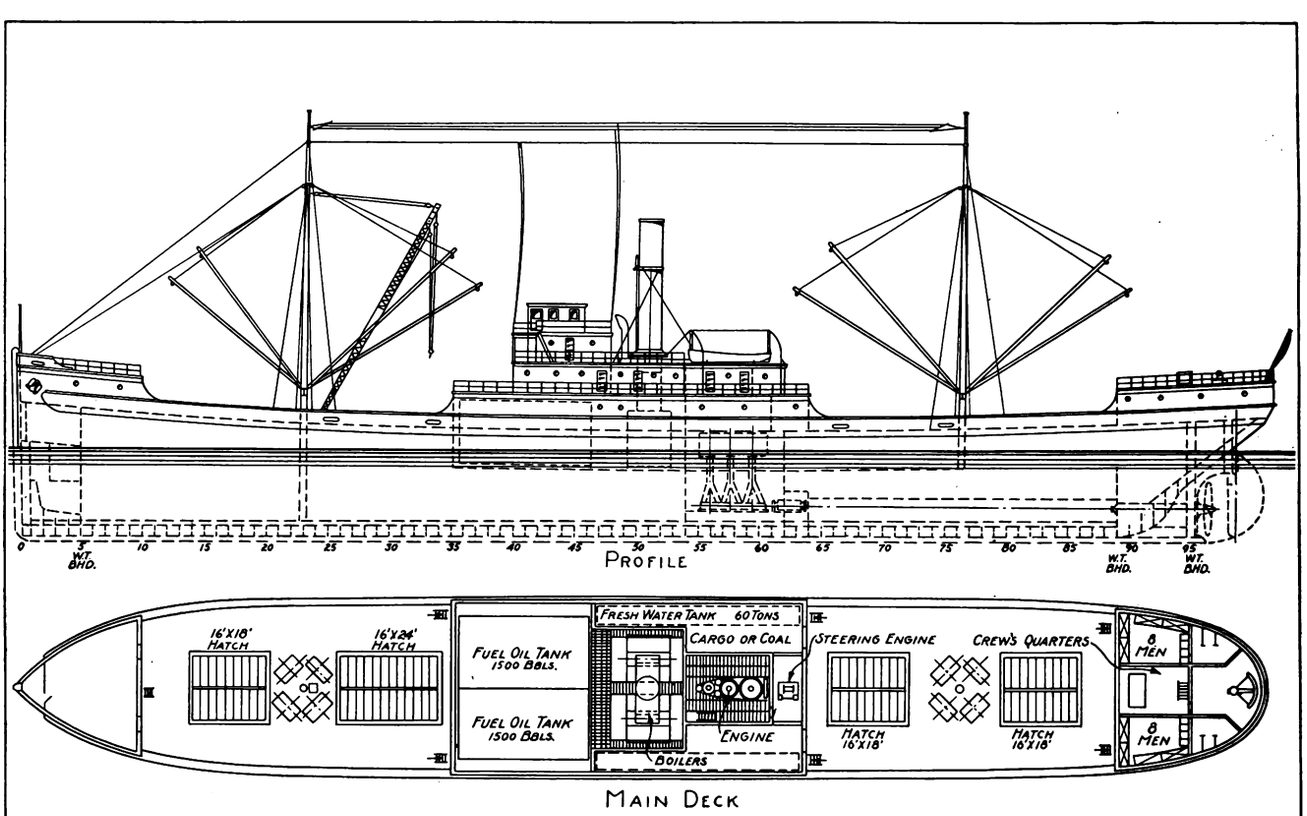

FIG. 41—OUTBOARD PROFILE AND DECK PLAN OF A TYPICAL 4000-TON WOODEN STEAMSHIP

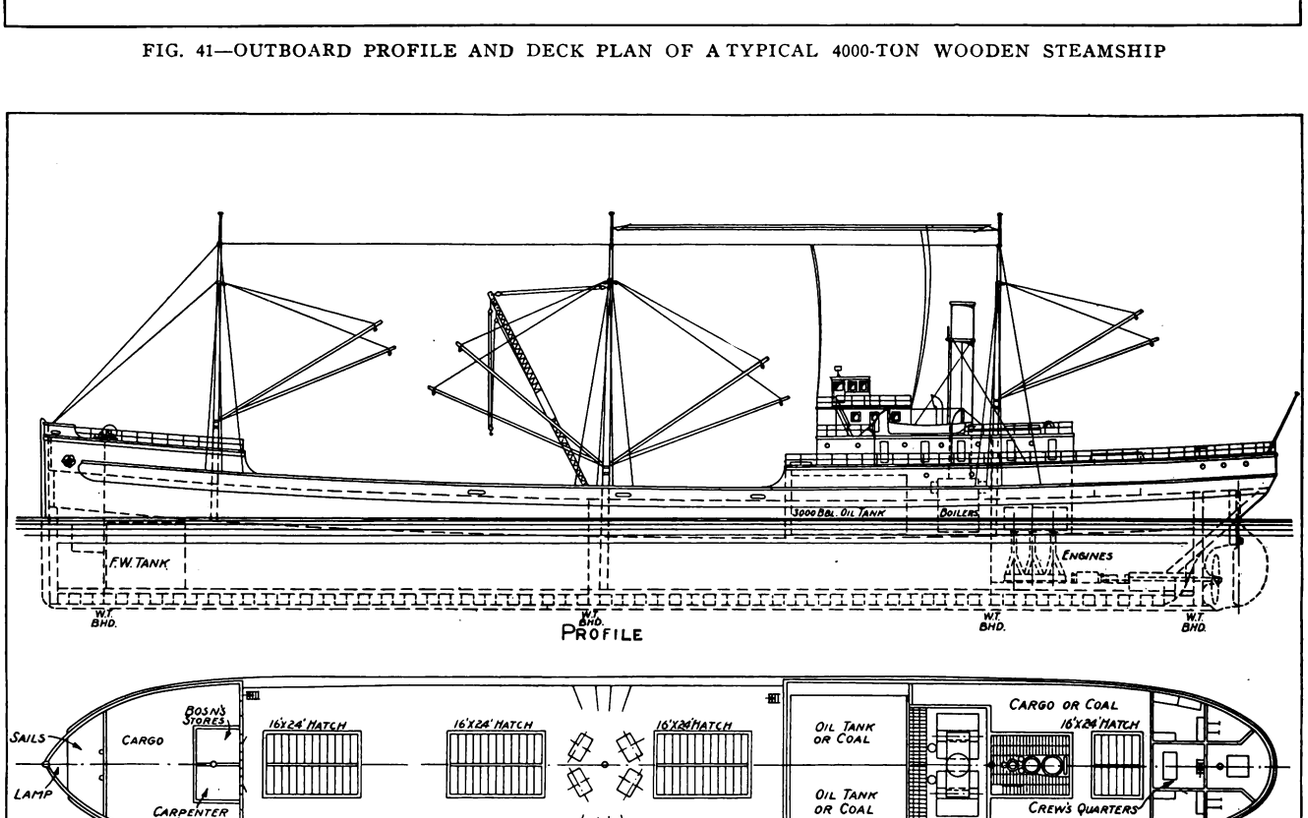

FIG. 42—OUTBOARD PROFILE AND DECK PLAN OF 4500-TON WOODEN STEAMSHIP WITH PROPELLING MACHINERY AFT

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hold is obtained through three 16 x 24-foot hatches.

A full-powered, 4000-ton motor ship of the standard Pacific coast type is shown in Fig. 42. This vessel is equipped with twin screws, each driven by a 400-horsepower, 6-cylinder oil engine. The boat is 265 feet in length, 43 feet beam and 26 feet deep. The machinery is placed aft as in the case of the steam vessel shown in Fig. 42. The general arrangement of the hull in fact, is very similar to that of the steamer. The main hold is reached by three hatches, the forward one being 16 x 23 feet and the after two 16 x 26 feet. The cabin accommodations are ample and plenty of oil capacity has been provided. The three vessels shown in Figs. 41, 42 and 43 were designed by Fred A. Ballin, Portland, Oreg.

Fig. 36 shows the midship section of keelson and by steel arch strapping on the sides.

The floors, which are sided 12 inches, are 26½ inches deep at the keel and 19 inches at the lower turn of the bilge. The frames, which also are sided 12 inches, are molded 16 inches at the upper turn of the bilge and 10 inches at the main deck. The frames, of course, are double and are spaced on 32-inch centers. The keel is 20 x 24 inches with a 4 x 20-inch false keel or shoe. The three garboard strakes on either side of the keel are 11 x 18, 9 x 18 and 7 x 16 inches, respectively. Between the garboard strakes and the bilge keels there are three courses of planking, 5 x 16 inches, 5 x 14 inches and 5 x 12 inches, respectively. The bilge keels, which are arranged as shown in Fig. 36, are 12 x 16 inches, fitted with a 4 x 12-inch shoe. Above the bilge keels there of an arch, extending up to the height of the hold beams amidship and tapering down on both ends. The general arrangement of this central girder is shown clearly in Fig. 44.

The method of fastening the various elements of the hull structure together is shown clearly in Fig. 36.

The steel reinforcing consists of two arch straps on each side of the vessel. These straps, which are built up of ¾ x 14-inch universal plates securely riveted together at the ends, are let into the frames under the planking as shown in Fig. 36. The two lines of strapping are about eight feet apart. They extend the full length of the ship in the form of an arch rising amidship to a point 3 feet above the main deck. At the ends they run down to the line of the bilge. These straps, supplemented by the center girder-keelson, add considerably to

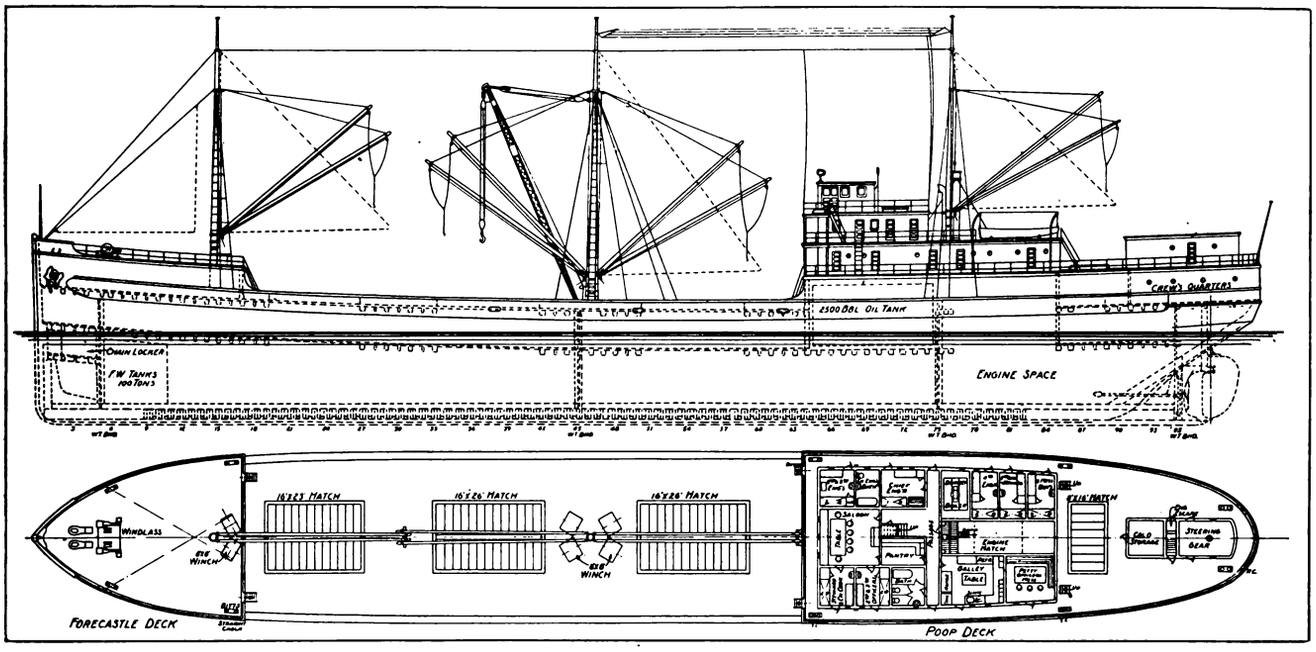

FIG. 43—OUTBOARD PROFILE AND DECK PLAN OF 4000-TON MOTOR SHIP DESIGNED FOR OVERSEAS SERVICE

the standard 5-masted auxiliary schooner illustrated in Figs. 35 and 44. A number of these vessels have been built by the Grays Harbor Ship Building Co., Grays Harbor, Wash. They are of the following dimensions: Length over all, 290 feet; length under deck, 274 feet; length between perpendiculars, 268 feet; beam, extreme, 48 feet; beam, molded, 46 feet, 10 inches; depth, molded, 26 feet 9 inches; depth of hold, 24 feet 6 inches. They are equipped with twin screws driven by 400-horsepower, 4-cylinder, crosshead type, 2-cycle oil engines built by the H. W. Sumner Co., Seattle.

A study of their cross section, Fig. 36, indicates that in their general design these vessels are similar to the standard Pacific coast type previously described, except that they are strengthened by means of a heavy center girder-

are two courses of planking consisting of eight strakes of 6 x 10-inch planks and 22 strakes of 7 x 8-inch planks.

The ceiling over the floors is 10 x 16 inches; over the bilges it is 14 x 14 inches and over the sides 12 x 12 inches. There are two sets of beams including 14 x 16-inch hold beams and 16 x 16-inch main beams. The hatch beams are 16 x 20 inches.

The keelson construction is one of the features of these vessels. The main keelson structure consists of five 20 x 20-inch pieces laid on the floors, surmounted by three 20 x 20-inch sister keelsons and a 20 x 24-inch rider. In addition, and this is where the construction differs from ordinary practice, there are eight 12 x 18-inch keelsons laid on top of the rider keelson. These latter keelsons form a sort of center girder. They are arranged in the shape

the longitudinal strength of the vessel. In addition, the deck beams are tied together by ¾ x 4-inch straps laid in four courses the full length of the ship. This vessel requires about 1,350,000 board feet of timber for its construction.

The cross section details of a 4000-ton wooden steamer are shown in Fig. 37. They form an interesting contrast to the motor ship illustrated in Fig. 36. This vessel is 290 feet in length over all, 270 feet between perpendiculars, 49 feet beam over the planking, with a depth of hold of 26 feet. In its general features, the design is somewhat similar to that prepared by Theodore E. Ferris for the United States Emergency Fleet Corp. The floors, however, have more dead rise than in the Ferris boat and some of the timber scantlings are different. The general dimensions of the planking and ceiling are about the

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same as those in the motor ship shown in Fig. 35. A similar system of arch strapping also is employed. The straps extend for three-quarters the length of the vessel.

The keelson construction in this case consists of five 20 x 20-inch keelsons laid on the floors surmounted by three 20 x 20-inch sister keelsons and a 14 x 14-inch continuous rider. On either side of the rider are 6 x 14-inch stringers. Instead of the center girder-keelson illustrated in Fig. 36, a central longitudinal bulkhead is employed. It consists of stanchions at alternate beams connected by a bulkhead built up of 6 x 12-inch timbers. These timbers are further strengthened by 4 x 10-inch diagonals on both sides. The details of this bulkhead construction are clearly shown in Fig. 37.

The lower deck beams are sided 16 inches and molded 14 inches. They are spaced on 3-foot centers. The hatch end beams are sided 20 inches and molded 14 inches. The main deck beams are 16 inches x 14 inches, the frames which are spaced 36 inches are sided 12 inches and molded 26½ inches over the keel. They also are molded 19 inches at the lower turn of the bilge, 17 inches at the center of the bilge, 16 inches at the top of the bilge, 10 inches at the deck and 9 inches at the rail. The frames, of course, are double up to the rail, which is 6 x 30 inches in section.

It will be noted that the use of knees for holding the beams in place has been obviated by the employment of a clamp and shelf type of construction. The clamp consists of three 12 x 12-inch pieces surmounted by the shelf which is built up of 12 x 14-inch, 12 x 12-inch and 16 x 16-inch stringers as shown in Fig. 37. This shelf construction is used for supporting both the lower and upper deck beams.

Hatch Construction

The hatch construction also is interesting. On the lower deck it consists of a 16 x 18-inch cover surmounted by a 16 x 16-inch coaming. The upper deck hatches consist of 16 x 18-inch carlins surmounted by 16 x 18-inch continuous stringers and 16 x 16-inch coamings. Each hatch is divided into two parts by a filler consisting of two 14 x 16-inch pieces surmounted by a 14 x 20-inch continuous stringer. The overall dimensions of the hatches are 12 x 22 feet, except the forward hatch, which is 12 x 18 feet.

A Novel Design

Fig. 40 shows the cross section details of a 4000-ton motor ship designed by Fred A. Ballin, Supple & Ballin, Portland, Oreg. The construction adopted by Mr. Ballin presents several novel features, the object of the designer being to produce a boat which will have strength equivalent to that of a steel hull without using excessive amounts of timber. To accomplish this purpose, unusually deep floors are employed, together with a double diagonal inner skin of planking and specially designed steel topsides. The details of the design are shown clearly in Fig. 40. The boat, which has a displacement of about 6000 tons and a capacity of about 4000 tons is 308 feet in length over all and 285 feet between perpendiculars. The molded beam is 43 feet and the molded depth 26 feet. The sheer forward is 7 feet; aft, 3 feet 6 inches. This vessel is driven by two 500-horsepower 6-cylinder Winton engines, built by the Winton Gas Engine Works, Cleveland. These engines are connected to twin screws.

The frames, which it will be noted are spaced on 36-inch centers, are sided 7¾ inches and are molded as follows: 21 inches at the lower turn of the bilge, 18 inches at the middle of the bilge, 16½ inches at the upper turn of the bilge; 14½ inches at the lower deck and 12 inches at the upper deck. The floors, which also are sided 7¾ inches, are 30 inches deep over the keel. There is one extra floor at each frame on all full frames. The keel is 15½ x 25½ inches arranged in three lengths with 10-foot scarfs. On either side of the keel are two garboard strakes 7½ x 20 inches reduced at the ends to 5 x 16 inches. They are provided with 9-foot scarfs. Outside of the garboards the bottom planking is 4¾ x 14 inches. The outer bilge planking is 4¾ x 10 inches and the side planking is 4¼ x 9 inches to the lower deck and 4¼ x 8 inches above that point. It will be understood, of course, that under this outer layer of ordinary planking are two thicknesses of 1¼-inch diagonal planking. This inner skin of double diagonals adds immensely to the strength of the hull. It also makes it possible to reduce the thickness of the ceiling very materially. Furthermore, the large number of keelsons commonly employed in Pacific coast ships are done away with. The keelsons in this vessel consist simply of one 15½ x 23½ inch main keelson with a 15½-inch square sister keelson on each side. The ceiling over the floor is 3¾ inches thick. The bilge ceiling is 5¾ x 11½ inches. The ceiling on the sides is 3¼ inches. The clamps under the lower deck beams are 5¾ x 15½ inches. Three are provided. Three 7½ x 15½-inch clamps likewise are provided under the main deck beams. The lower deck beams are braced by steel knees spaced on 72-inch centers. The upper deck beams are similarly supported by 3-foot steel knees also spaced on 72-inch centers. These knees are of plate and angle construction, their general arrangement being clearly indicated in Fig. 40.

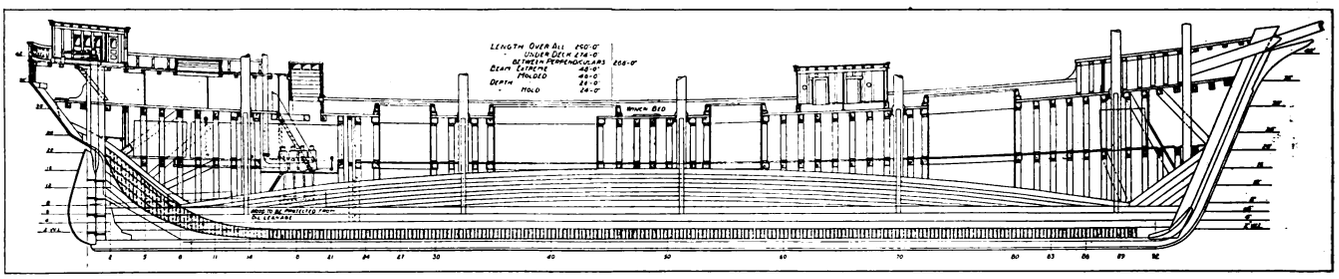

FIG. 44—INBOARD PROFILE OF 5-MASTED, TOPMAST AUXILIARY SCHOONER SHOWING ARRANGEMENT OF CENTER GIRDER-KEELSON

This illustration also shows the details of the steel plate topside. This reinforcement consists of a 54-inch x 20-pound girder plate on the outside of the frames, a 36-inch x 15-pound girder plate on the inside of the frame and a 48-inch x 20-pound deck stringer plate. The two girder plates are tied together by a 22-inch x 20-pound rail plate, the connection being made 3½ x 3½ x 12.4 pound angles. The girder plates, also, are tied to the deck stringer plate by angles. The whole forms a very rigid topside construction, the details of which should be studied by referring to Fig. 40.

An Opinion From England

The merits of the double diagonal planking system adopted by Mr. Ballin, are interestingly set forth by W. H. White, late chief constructor of the royal navy, Great Britain, in his "Manual of Naval Architecture." In this book Mr. White says:

"Other composite ships have been con-

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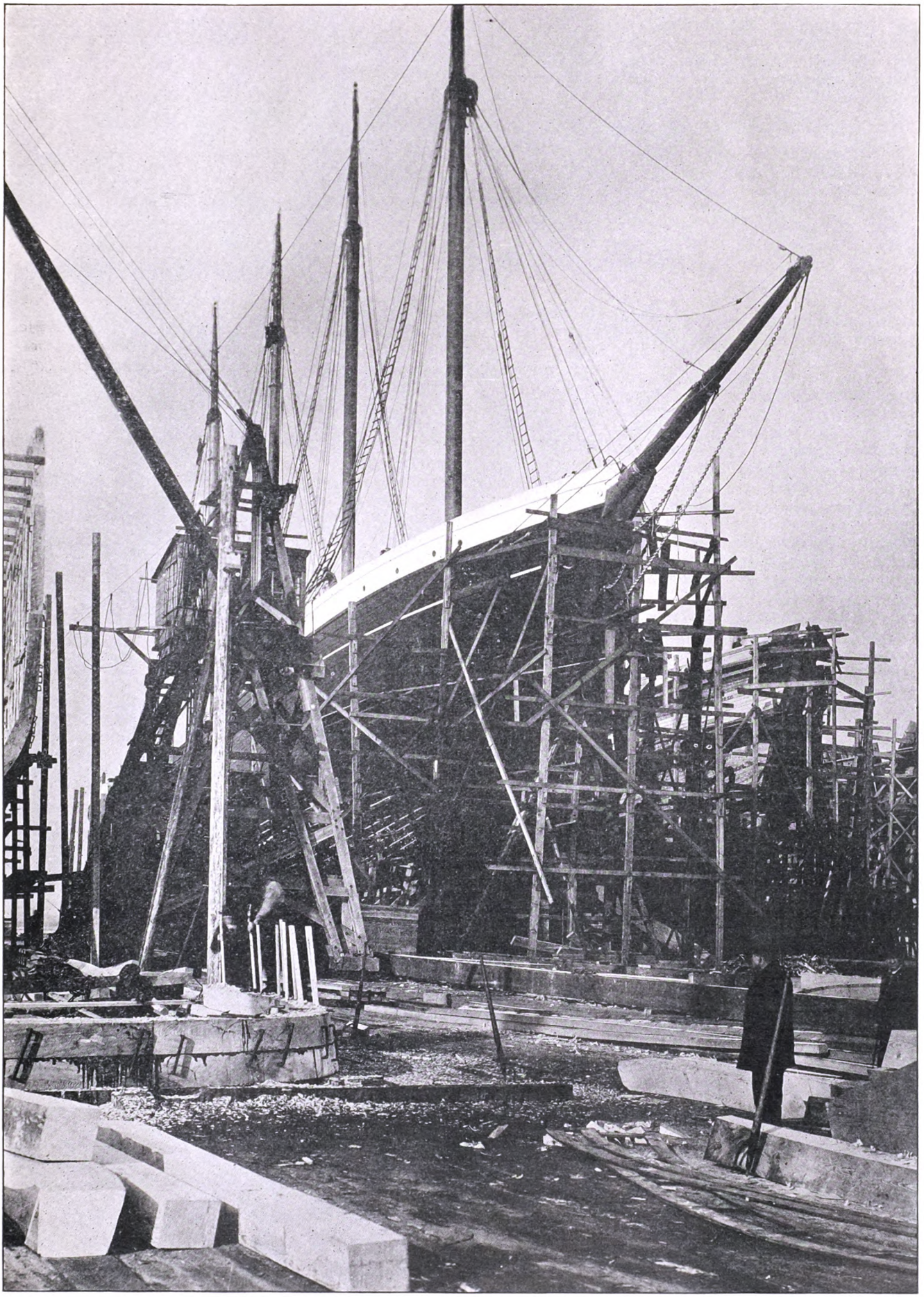

FIG. 45—A TYPICAL 4-MASTED WOODEN AUXILIARY SCHOONER UNDER CONSTRUCTION ON PUGET SOUND

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structed with the skin planking in two thicknesses, one or both of which had the planks worked diagonally; it was then unnecessary to fit diagonal rider plates to assist the skin against racking strains.

The Diagonal System of Planking

"This diagonal system of planking has also been adopted in some special classes of wooden ships with great success. The royal yachts are examples of this system of construction. Three thicknesses of planking are employed, the two inside being worked diagonally and the outer one longitudinally. The two diagonal layers are inclined in opposite directions and the skin thus formed possesses such superior strength to the skin of an ordinary wooden ship that there need be comparatively little transverse framing above the bilges. Direct experiments with models and the experience gained with ships built on this plan, have demonstrated its great combination of strength and lightness. The royal yacht VICTORIA AND ALBERT, built on this plan, with her unusually powerful engines and high speed, is subjected to excessively great sagging moments, but has continued in service for nearly 40 years with complete exemption from signs of weakness. Like many other improved systems of construction, this is found rather more expensive than the common plan, but if wood had not been so largely superseded by iron and steel, probably much more extensive use would have been made of the diagonal system."

It is necessary when building a wooden ship to work out the weights of the various items in the structure carefully. The following table will give an idea of what these figures come to in the case of an actual ship. The figures given below are the hull weights of a motor schooner built by the Aberdeen Shipbuilding Co., Aberdeen, Wash., for the French-American Shipping Co., New York. These boats are 252 feet in length over all and 221 feet between perpendiculars. The length of the keel is 220 feet. The extreme beam is 43 feet, the molded beam 40 feet 2 inches and the depth of hold is 21 feet. The hull weights are as follows:

Item	Pounds
Oakum	8,000
Auxiliaries	8,000
Anchors and chains	38,350
Boats	2,000
Cabin and forecastle fittings	10,000
Davits	2,000
Deck piping and pumps	3,000
Donkey boiler	8,000
Engine room piping, air bottles, lead sleeve	4,000
Exhaust piping	2,200
Fastenings	266,000
Fresh water	58,156
Lumber	3,166,350
Main engines	56,000
Oil	270,000
Propellers	4,000
Rigging	20,000
Spars	49,200
Shafting	10,000
Steering gear	1,000
Strut	4,000
Tanks	26,000
Windlass	16,000
Winches, 3	30,000
Spikes	40,000
Clinch rings	2,500
Iron bark	30,000
Paint	70,000
Total	4,206,756

An interesting formula for estimating the carrying capacity of wooden ships of the standard Pacific coast type with heavy center keelsons has been worked out by western engineers. This formula is as follows:

$C = 1.15\ L\ W.$

Where C is the carrying capacity in pounds
L is the number of board feet of lumber required to build ship.
W is the weight of the timber per board foot.

If actual experience is any guide, it requires from seven to nine months to build a wooden vessel on the Pacific coast under existing conditions. Claims have been made that 3500-ton boats could be built in four months, but in no case under the writer's observation, has this been substantiated, even approximately. It is the writer's judgment that with the proper yard organization and care in assembling materials promptly, these boats might be constructed in five or six months at the minimum.

While it is possible to crowd the construction by adding more men to the job, the point is soon reached where additional men do not result in proportionately increased progress. One of the oldest practical ship builders on the Pacific coast claims that it is not economical to work over 50 to 60 men on one hull. About 25 per cent of these men should be skilled.

It is believed a study of the drawings, reproductions of photographs and data included in this chapter will give the reader a clear idea of the general features of modern wooden ship construction. It is not intended in this series to go into the theoretical side of the problem. The purpose of this work is simply to present practical facts regarding actual construction operations.

Theory is Complicated

If the reader is interested in becoming familiar with the methods of designing and laying down ships, including the preparation of the lines, the calculation of the displacements, trim, etc., he should refer to standard works on naval architecture dealing with this subject. It might be stated, however, that the theoretical side of ship design is exceedingly complicated. Even the comparatively simple problem of preparing the sheer draft or lines of a wooden vessel involves a knowledge of the principles of descriptive geometry not possessed by persons who have not made a special study of this branch of mathematics.

One great trouble, however, with the product of many modern wooden ship building yards, lies in the fact that in a large number of cases the boats are not designed by competent architects, but are simply built by rule of thumb methods. In this day and age, such procedure is hardly acceptable in any department of the mechanical world. On the other hand, it must be thoroughly understood that the scientific principles of ship designing cannot be learned in a few months, particularly by persons who have not had the benefit of general technical and mathematical training.

Old Sealers Again in Service

Advices received from St. Johns, Newfoundland, indicate that for the first time in over a decade no big ships will be employed in the seal hunting season of 1917. The season has opened with the smallest fleet and the fewest men employed in modern times. This is not, however, an unmixed drawback, because the fleet is, as a whole, composed of less expensive ships than heretofore, and can be run more cheaply, while they are more homogeneous in type, about equally balanced in speed and strength, and will thus stand a better chance of an equal distribution of the kill among them, while the high prices prevailing for skins and oil, especially the latter, promise to assure exceptional results.

This year, it may be said, the sealing industry enters upon a new era. Until about 12 years ago all the vessels were of the wooden "whaler" type. This type now is almost extinct, but reversion to it has been made this year. A new vessel, appropriately termed ADVENTURE, was constructed of steel and employed in the industry and proved such a success that the same owners at once built two other ships—BONAVENTURE and BELAVENTURE—while other firms in the Newfoundland trade constructed similar vessels, until by 1913 there were no fewer than 10 such craft in the industry. These ships, some of them approaching the dimensions of Atlantic liners and all of them of special construction and high speed, completely outclassed the older vessels, some of which were actually laid up, it being found impossible to run them in competition with the new crafts.

Then came the war and with it a demand from Russia for these big ships for ice breaking purposes in the White Sea, resulting in the withdrawal of some of them early in 1915, others during that summer and the rest at the opening of 1916, save for two sister ships, STEPHANO and FLORIZEL, utilized as passenger boats between New York and St. John's for 10 months of the year, and as sealers in March and April, which were returned for the ordinary traffic needs of the colony until STE-

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PHANO was sunk by the German U-53, last November, while FLORIZEL, owing to the congestion of freight traffic on her regular route, has had to be continued in that trade this season.

In this industry, as in other forms of marine enterprise, an old type of ship is being resorted to, some of the sealers not used for two or three years being refitted and put in the trade again; and one craft, THETIS, has been purchased from the American government on the Pacific coast, brought through the Panama canal and put into service again on the Pacific in this industry. The history of this ship is not without interest in view of this development. She was built in 1880 by a Dundee firm for the sealing and whaling industry, and was operated from St. John's for five seasons until she was purchased by the American government in 1885 to be sent north by the United States authorities to rescue the Greeley arctic expedition, located at Lady Franklin bay, in the polar regions, a task in which she and her consort, BEAR—another of the Newfoundland sealing fleet—were fairly successful, reaching Cape Sabine and recovering the six survivors of the 28 Americans involved in that tragic chapter of exploration in the frozen zone. The United States retained these two ships, sent them round Cape Horn, and utilized them as revenue cutters off the Alaskan coast until last year, when they sold THETIS, having decided to employ a more modern craft, and converted BEAR into a storeship. THETIS thus finds herself again employed in the very industry in which she began her career more than a generation ago, and from which she departed under such notable circumstances.

Saving Sinking Ships by Adding Water

THE system of saving sinking ships by pumping more water into them, with which the names of Messrs. Brunton is associated, is of enormous importance at the present time, when so many vessels are being lost through damage inflicted by torpedo and mine, says *The Liverpool Journal of Commerce*. It is claimed that the Brunton system, if generally adopted, would be the means of saving a considerable percentage of these ships, and it is satisfactory to learn that some well-known ship owners as well as those associated with government departments are giving attention to this subject. It is generally recognized that questions relating to flooding assume a somewhat complicated form, and recent experience has tended to modify some of the opinions previously held.

Certainly at first sight the proposal to save a ship which has already one or two compartments open to the sea by pumping more water into the vessel appears to be at variance with all preconceived ideas, but since the results of model experiments of the Brunton system are being confirmed in full-sized ships, it is certain that serious consideration will have to be given to the wider adoption of the invention. It is significant that as a result of the many demonstrations of the Brunton system given to German naval architects before the war the principles of the Brunton system are believed to have been adopted in the German navy, and this belief serves to explain one of two incidents during naval engagements which created some surprise at the time.

The main idea underlying the Brunton system is that instead of attempting to pump the water out of a damaged compartment, which it may be assumed is a forward compartment, water is pumped from the sea into the after compartment to a height above the sea level, the admission of this water having the effect of depressing the stern and raising the bows of the vessel, so that water which has found its way into the forward compartment can be discharged into the sea through the breach until the ship is back again on an even keel. It is important that the weight of water admitted should be put in as far from the damaged compartment and from the center of buoyancy as possible, and on the smallest area of water plane so that the moments are greatly increased by the weight of water in the after compartments, the center of gravity of this water being as far as possible from the center of buoyancy.

In the case referred to above, as the stern is depressed and the bow of the ship lifted it becomes possible to discharge some of the water in the stern compartment, retaining only enough to counterbalance the weight of the material of the bows of the vessel, as clearly the water in the bow compartment open to the sea has no effect on the weight of the ship. When an even keel is finally restored, although the draft of the vessel is greater than before, she contains less water than when down by the head before the flooding of the stern compartment. In the case of side compartments being flooded through war damage or accident the principle is put in force by pumping water into a corresponding compartment on the other side of the ship, absolute control of the water admitted being maintained throughout.

The system is applied in practice by the utilization of the main circulating discharge water. On each main discharge pipe between the condenser and the main discharge valve at each side of the ship a branch pipe is taken and connected to a sluice valve, these valves being operated by hydraulic cylinders. One main flooding pipe is placed on each side of the ship along the whole length of the vessel, with a cross connection between them, and branch pipes are carried into every compartment. The method provides against the danger of a compartment being accidentally flooded, and at the same time it is possible to divert the whole of the main circulating discharge water into any one compartment so that no time is lost in trimming a sinking ship. It is necessary that the gear should be worked in conjunction with a reliable door system to ensure that the doors of the compartment are closed.

It is easy to demonstrate by experiments such as those which are constantly being conducted by the inventors, that some conventional ideas entertained as to the proper method of sinking by gunfire or torpedo a ship already damaged in the course of an engagement are erroneous. A little consideration will show that in the case of a warship equipped with the Brunton system being damaged in the forward compartment and showing signs of sinking by the bows it is necessary to ensure the sinking of the vessel that the stern compartment should be damaged, as it is the water in those compartments which has been admitted immediately following the flooding of the bow compartment, which is keeping the vessel afloat. The idea may seem a little revolutionary, but there is a growing opinion among naval architects who have given careful consideration to the question that the system is a sound one. Apart from the saving of the vessel there are one or two other advantages associated with this method. There is no necessity for minute subdivision, and no watertight decks are required, as the water is prevented from rising to a height that would endanger the utility of the bulkheads.

Capt. E. A. Richardson, long in employ of the J. S. Emery Co., and a well-known navigator, is dead at his home, Deer Isle, Me., aged 70.

Capt. H. S. Chase, a commander in the Merchants & Miners Transportation Co.'s fleet, has been appointed master of Henry Ford's steam yacht SIALIA, taken over by the government.

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July Ore Shipments

In the face of discouraging delays due to car shortage, the lake fleet broke all ore carrying records in July. Shipments from upper lake ports aggregated 10,241,633 tons, the first time that the fleet has carried more than 10,000,000 tons in any one month. As a result of this splendid record, the present season's total movement is only 2,988,956 tons behind shipments for the corresponding period of last year. This represents a gain of 491,476 tons from July 1, when the decline from last year aggregated 3,480,432 tons.

Total shipments up to Aug. 1 total 26,376,768 tons against 29,365,724 tons shipped up to Aug. 1, last year. The goal of 60,000,000 tons which, it is figured, the fleet must move to keep the country's blast furnaces supplied during the closed season, seems certain to be reached. The fleet must move 34,000,000 tons in the next four months. This record will undoubtedly be made provided the car situation does not become more acute. Measures which are now being carried out are designed to relieve the car situation and to cut down delays at unloading ports. With improved dispatch, the fleet doubtless could have moved 11,000,000 tons in July.

The following table shows the July and the season's shipments by ports:

Port	July	To Aug. 1
Escanaba	932,274	3,137,571
Marquette	643,887	1,269,636
Ashland	1,238,326	3,147,794
Superior	2,231,502	5,757,584
Duluth	3,543,873	8,672,767
Two Harbors	1,651,771	4,391,416
Total	10,241,633	26,376,768
1917 increase	491,476	
1917 decrease		2,988,956

Lake Erie Receipts

Out of a total of 10,241,633 tons of iron ore shipped from upper lake ports in July, Lake Erie ports received 7,651,882 tons, as shown by the records of THE MARINE REVIEW. The balance on dock on Aug. 1 was 5,719,481 tons, against 4,810,671 tons on Aug. 1, 1916. The detailed receipts by ports follow:

Port	Gross tons
Buffalo and Port Colborne	1,250,309
Erie	271,228
Conneaut	1,484,016
Ashtabula	1,474,460
Fairport	375,551
Cleveland	1,452,898
Lorain	685,168
Huron	244,082
Toledo	362,904
Detroit	51,266
Total	7,651,882

Harbor tug ETHEL, built at Athens, N. Y., in 1901, has been sold for Salem, Mass., owners to P. W. Zook, Philadelphia, for $15,000.

The steamer E. J. EARLING collided with the schooner BELLE BROWN while coming down through St. Clair flats channel in the forenoon of Aug. 7. The schooner went to the bottom about one and one-half miles below the old lighthouse at the lower end of the old channel. The BELLE BROWN is owned by Inglebert Tellefson, Milwaukee. She was built in 1873 and is 174 feet long. The EARLING was not damaged.

Prominent Vessel Broker Dies

Capt. Alfred Mitchell, for the past 52 years actively associated with marine enterprise on the Great Lakes, and well known in Cleveland marine circles as head of Mitchell & Co., vessel insurance and brokerage agent,

CAPT. ALFRED MITCHELL

died of Bright's disease Sunday morning, July 29, at his home, 11015 Wade Park avenue, Cleveland.

Captain Mitchell was born in Canada in 1853. He began his long marine career at the early age of 12, when he hired out as a hand on a logging barge. At the age of 17 he, together with his brother, John Mitchell, and William Rouvell, purchased and navigated the lumber barge EVERGREEN.

While serving as captain of the steamer EDWARD SMITH, Capt. Mitchell rescued 13 members of the crew of the steamship ANNA YOUNG, which foundered in Lake Huron. For this deed, he was presented a gold medal by the United States government and a gold watch by the owners of the foundered vessel.

Captain Mitchell was one of the few men on the Great Lakes who possessed both a captain's and an engineer's certificate. As a partner in the firm of Mitchell Bros., he owned and managed vessels for a period of 26 years. When his brother, John Mitchell, stepped out of the partnership in 1903, he alone conducted the affairs of the business, which was renamed Mitchell & Co.

Captain Mitchell is survived by his widow and seven children: Alfred W., John D., Lawrence R., Edward T., and Harry Mitchell, Mrs. Gertrude Cole and Mrs. Clarence Lankin. The funeral was held at St. Agnes church, Cleveland, July 31.

Soo Canal Report

Although shipments of iron ore from the Lake Superior district in July were the highest on record, the commerce through the Soo canal last month fell below the total set in July, 1916. July's movement aggregated 13,650,047 net tons against 14,048,494 net tons in July last year. The total freight movement through the Soo canals up to Aug. 1 shows a decline of 5,576,319 net tons from the tonnage moved in the corresponding period of 1916. Up to July 1, the decline was 5,177,962 net tons, and to June 1, 5,442,656 net tons. The total movement so far this year aggregates 35,941,392 net tons, against 41,517,711 net tons moved to Aug. 1, 1916.

Of the July movement, 10,772,964 net tons passed through the American canal and 2,877,083 net tons through the Canadian canal. The eastbound movement aggregated 11,034,500 net tons and the west bound movement 2,615,457 net tons. The eastbound iron ore movement totaled 10,308,743 net tons and the westbound coal movement 2,382,676 net tons.

The detailed report of the Soo commerce up to Aug. 1, 1917, and to Aug. 1, 1916, follows:

	To Aug. 1, 1916	To Aug. 1, 1917
EAST BOUND		
Flour, barrels	3,426,777	3,186,768
Wheat, bushels	116,031,294	77,353,023
Grain, bushels	43,063,265	40,737,930
Copper, net tons	44,854	52,518
Iron ore, net tons	28,046,522	25,263,561
Pig iron, net tons	17,015	2,924
Lumber, M. ft. B. M.	138,985	147,318
Gen'l merch., net tons	99,892	90,245
Passengers, number	12,956	7,387
WEST BOUND		
Flour, barrels	13,165	80
Grain, bushels	2,560	750
Coal, hard, net tons	983,458	1,046,402
Coal, soft, net tons	6,733,159	5,159,075
Iron ore, net tons	17,503	36,985
Mfctd. iron, net tons	76,472	44,838
Salt, barrels	374,072	284,486
Gen'l merch., net tons	592,859	574,331
Passengers, number	12,196	7,619
SUMMARY		
Vessel passages, No.	11,535	9,577
Regis. tonnage, net	31,803,886	27,882,886
Freight:		
Eastbound, net tons	33,057,028	29,037,558
Westbound, net tons	8,460,683	6,903,834
Total frgt., net tons	41,517,711	35,941,392

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Decides New Point in Maritime Law

Ruling Made in Eastern Court Covers Conditions New to American Courts—Case Arose Over Temporary Withdrawal of Two Steamers From Charterer's Service

AN OPINION of interest to the shipping public and to admiralty attorneys was handed down recently in a case which involved points never decided previously in America. The opinion was given by the arbitrator, former Judge George C. Holt, United States district court of New York. The case paralleled closely that of the steamship ANTONIOS MAVROGORDATOS, decided a few months ago by Justice Sankey in the king's bench division in London, England.

The arbitration resulted in an award of approximately $55,000 to O. G. Hempstead & Son, Philadelphia. The other party to the case was Peirce Brothers, Naples, Italy. Conlen, Brinton & Acker were attorneys for the Hempstead interests, and Kirlin, Woolsey & Hickox for Peirce Brothers.

What the Case Was

The arbitration related to the withdrawal by Hempstead & Son of two steamers from the service of Peirce Brothers. The steamers were chartered in March, 1914, to Peirce Brothers and on Nov. 5, 1914, Hempstead & Son withdrew the steamers from the charterer's service for nonpayment of charter hire. Later it was agreed that the steamers should complete the charter, but that if the withdrawal was held to be proper, Peirce Brothers should pay for the voyages made after the withdrawal at the then current market rate instead of the charter rate of hire.

Peirce Brothers contended that no hire money was due because Hempstead & Son had purchased bunker coal from them which up to the time of withdrawal had not been paid for. After noting that the single question before him was whether hire was overdue and unpaid, Judge Holt said:

"My opinion is that Peirce Brothers has no right to offset the amounts due them for bunker coal furnished at Naples against the payments due from them for hire. The provision in the charter party was that the hire was to be paid in advance in cash semi-monthly at London.

"By an agreement between the parties bunker coal was to be paid for by drafts drawn on Hempstead & Son, payable 30 days from date. In my opinion, the fact that Hempstead & Son refused to accept the draft for £876 on Sept. 10 in full afforded no reason why the hire of the first half month of FIFE on its third voyage, due Sept. 7, should not have been paid in cash at London. So the second month's hire on her third voyage, due Sept. 22, amounting to £804, admittedly was not paid in full; the sum of £500 only having been paid on Sept. 26, and the second half-month's hire of FINN, amounting to £802, due on Oct. 6, the balance due upon FIFE on Oct. 13 and the balance due on FINN on Oct. 23 were required to be paid in cash and could not be offset against the amounts due on bunker coal which were to be collected by drafts payable 30 days from date.

"The bunker coal supplied to FIFE on Oct. 14, amounting to £956, and to FINN in October, amounting to £960, could not be offset on any theory, because they were not due until 30 days after the date of the draft to be drawn against them, which would be subsequent to the time the hire was payable. Debts not due cannot be set off against debts due in any case. But the rule is well settled that hire must be paid promptly and fully according to the terms of the charter party, and that other claims arising out of the voyage cannot be set off against them" (Tyrer vs. Hessler, 7 Com. Cases 166; Wilhelmsen vs. Tweedie Trading Co., 149 *Federal Reporter* 928; Luckenbach vs. Pierson, 229 *Federal Reporter* 130; Italian State Railways vs. BITZAS and MAVROGORDATOS, Lloyds List, Feb. 16, 1917, page 11.)

Discusses Unusual Point

A further novel point discussed and decided by Judge Holt in this proceeding was the right of an owner to withdraw a vessel from the service of a charterer while the vessel, between trips made for the charterer's account, was temporarily in the owner's possession, Judge Holt said:

"It is stated in the brief of the counsel for Peirce Brothers that as on Nov. 5 the vessels were not being operated by Peirce Brothers but were being operated by Hempstead & Son for their own account, Hempstead & Son could not withdraw the vessels from the service of the charterers; that under the authority of Luckenbach vs. Pierson, 229 *Federal Reporter* 130, they might have given notice of the withdrawal on the trips from the United States to Italy, and such notice would become effective on the arrival of the vessel at the port of discharge and the completion of the discharge of the cargo, but they could not withdraw the steamers while in their own service. The case of Luckenbach vs. Pierson simply holds that after a vessel is loaded and when she is on a voyage the owner cannot withdraw her on the ground that the time has not been paid, but that by giving notice of withdrawal on the voyage it becomes operative after the discharge of the cargo. Both steamers had finished their voyages to Italy, had been redelivered and were in the possession of Hempstead & Son at the time the notice was given, and I cannot see why Hempstead & Son could not withdraw the steamers at that time."

Italy Helps Merchant Marine

The proper development of the Italian merchane marine is among the foremost questions which are under discussion in that country at the present time. The council of ministers, in accordance with the proposals of the ministry for transportation, has adopted the following measures with a view to encouraging an immediate increase in the merchant fleet:

1. The profits made by cargo boats purchased abroad and which become a part of the Italian mercantile marine within two years from Aug. 8, 1916, shall be exempt from the payment of the income tax and from the extraordinary war surtax during the first three years of their operation.

2. The same exemptions from imposts and surtaxes shall be granted for four years to cargo boats constructed in Italian ship yards, upon the declaration that construction began after May 24, 1915, and that the vessel will become a part of the Italian mercantile marine and will be put in service before Dec. 31, 1918.

3. To cargo boats the construction of which is commenced in Italian ship yards after the publication of these provisions and for the entire duration of the war there is accorded entrance, free of customs duties, to material of foreign origin necessary for the construction of all parts of the ship; that is, hull, motors, boilers and auxiliary apparatus.

4. To the ships themselves is granted a construction subsidy of 85 lire ($16.40) per gross ton, in conformity with article 4 of the law of July 13, 1911—this, of course, annulling the customs rebate set forth in article 2 of said law, in view of the fact that the materials will be exempt from customs duty. As to the construction of machinery, boilers and auxiliary apparatus, the subsidies estab-

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lished by article 3 of the said law still remain in force. (Experts reckon that the average of the two subsidies amounts to 105 lire ($20.25) per gross ton.)

5. Cargo boats constructed as indicated above must begin active operation within two years from the declaration of construction. Should this limit of time be exceeded, the constructor shall not be entitled to any compensation other than that fixed by the law now in force.

6. Vessels purchased, as well as those built in accordance with the preceding provisions, shall enjoy one year's exemption from any requisition, civil, military, or for obligatory transportation, to be computed from the date of registration as an Italian vessel.

7. The ministry for transportation, after hearing the central traffic commission, may determine the conditions for transportation upon requisitioned ships from foreign countries to Italy of all the material needed for the construction of cargo boats in Italian ship yards.

8. In order to enjoy the benefits of these measures, vessels must be owned wholly by Italian citizens or by companies legally established in Italy, of which the president of the administrative board, the delegated administrator and an active majority of the members of the administrative board shall be Italian citizens. The vessels shall be classified in the Italian national register, shall retain such classification for a period of at least five years, and shall not be sold during this period to persons or companies which are not authorized by legal sanction to be proprietors of Italian vessels.

Vandalia, First Great Lakes Propeller

By Frank R. Rosseel

IN HIS "Book of Reminiscences" in possession of the Buffalo Historical Society, Captain James Van Cleve wrote of the introduction of the screw propeller on the Great Lakes. He showed, along with the text, a water color of the first Great Lakes propeller —VANDALIA, 1841. This picture bears Captain Van Cleve's notation, "VANDALIA as she appeared when she first came out; sketched by Captain Van Cleve." Today we would call her a barrel-bowed sloop with an auxiliary engine. Nevertheless she created a great sensation on Lakes Erie and Ontario in 1841, and was the ancestor of the 600-foot freighters that now navigate the lakes. I quote Captain Van Cleve as follows:

"While on a visit in the city of New York in the month of December, 1840, I was called upon by Josiah T. Marshall, formerly one of the firm of Bronson, Marshall & Co., of Oswego, who informed me that our friend Sanderson, of Brookville, Canada, who had boats on the Rideau Canal, had requested him to go and examine Ericsson's Propeller and give him his opinion as to its application to the propelling of boats on the Canal—Mr. Marshall stating that as he had no practical experience in steam machinery he wished me to go with him to the Engine Works of Hogg & Delemater and examine the Propeller hung there upon a shaft for the examination of all parties interested, and give him my opinion which he would transmit to our friend Sanderson.

"After examining the Propeller with great care, I stated to Mr. Marshall that it was my opinion it would produce a revolution in the propelling of vessels, and must result in a complete change in the steam marine of the Lakes.

"He then requested me to go with him and he would introduce me to Captain John Ericcson, the patentee, who had rooms at the Astor House.

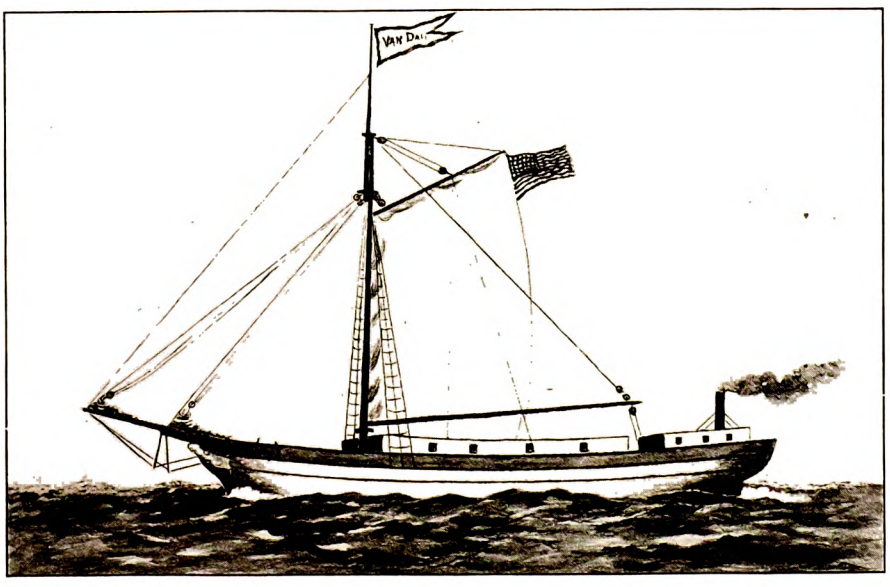
"After a conversation of about two hours with Captain E., respecting the commerce of the Lakes, he got up from his table, walked two or three times across the room, and then made me the following proposition:

" 'Captain Van Cleve, if you will put a vessel in operation with my propeller on the Lakes within one year, I will assign to you one-half interest in my patent for all the North American Lakes.'

"I accepted the proposition, the papers were drawn accordingly, and I left for Oswego. After an exhibition of the Propeller, plans, etc., a few days, I concluded an arrangement for the building of a new vessel with Sylvester Doolittle, who then had a ship yard at Oswego. The parties interested in the vessel were: Sylvester Doolittle, one-fourth; Captain James Van Cleve, one-fourth; Bronson & Crocker, one-fourth; and Captain Rufus Hawkins, commander of the vessel, one-fourth. I made an arrangement with C. C. Dennis, of Auburn, for building her engine.

"This vessel was named VANDALIA. She was sloop rigged and made her first trip in November, 1841, to the head of Lake Ontario, experiencing good and bad weather, and proved a success, thus carrying out my contract with Captain Ericsson in 11 months.

"The VANDALIA's dimensions were: 91 feet long on deck; 20 feet 2 inches beam; and 8 feet 3 inches depth of hold, with 138 tons burden."



From a copyrighted painting by Frank R. Rosseel

THE VANDALIA OF 1841, FIRST PROPELLER ON THE GREAT LAKES

First Screw Steamers on Lake Erie

The first screw wheel steamers built west of Lake Ontario came out on Lake Erie in 1843. They were SAMSON and HERCULES. It was some time before the screw wheel began to supplant paddle wheels generally on the lakes. The Honorable Crocket McElroy, in his "History of the Great Lakes", (published serially in *Buffalo Express* in 1911) says: "In 1848 nearly every steamboat on the Lakes, no matter what trade she was engaged in, was propelled by paddle wheels, and a screw wheel steamer was rarely seen." Nevertheless, within 50 years of the building of VANDALIA, the whole chain of lakes swarmed with

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screw-driven steamers of every description, doing every line of work, and by 1900 sidewheel freighters and tugs were practically a thing of the past.

Asks Labor to Help

A meeting attended by representatives of organized labor, Secretary of Commerce Redfield, Secretary of Labor Wilson, and other officials was held at Washington recently. Such labor men as have voiced opposition to the employment of others than American citizens as officers on merchant ships, and who have opposed the use of non-union men, were asked to do nothing that might block the government war plans.

Secretary Redfield told the labor representatives that every day of delay on an American boat might result in the loss of 1500 American lives in France, and that it was the duty of all in the war emergency to get together for the good of the country. Secretary Wilson, quoting from the caption of a cartoon published soon after Germany announced its unrestricted submarine warfare, used this statement to emphasize his contention that it was the patriotic duty of all citizens to build and man a great merchant fleet:

"After Germany had broken all promises made to the United States government the kaiser told us that one day in every week we could send one ship to Falmouth. We replied that on seven days in every week the kaiser could go to hell."

It was generally understood, following the conference, that the government would follow the policy made possible by a recent executive order permitting others than American citizens to serve as officers, and that non-union men would not be denied the right to serve the country on merchant ships.

Lumber Men Urged to Ship Wood for Boats

Chairman Edward N. Hurley, of the shipping board and Rear Admiral W. L. Capps, general manager of the emergency fleet corporation, met a few days ago with about 150 representatives of the southern pine producers. The lumber producers were told that they must provide the government's needs which up to this time have not been met. So far the lumber has been provided for 63 of 100 ships promised. Aside from this quota assigned to the south, the shipping board has contracted for an additional quota of 66 ships and is negotiating for 88 more.

W. J. Haynan, a producer of Hattiesville, Miss., said that the south could furnish 200 ships, and that, in his mind, it was the patriotic duty of the other producers to join in accomplishing this. V. M. Scanlon, from the same producing district, said he was trying to do his part, and added that if there were slackers among the producers who were selling to private capital because they could obtain more than the $35 a thousand feet agreed upon, he hoped the government would use force to bring them into line. Men who refused to place their full producing capacity at the disposal of the government, he said, should be held responsible for the loss of American lives in France.

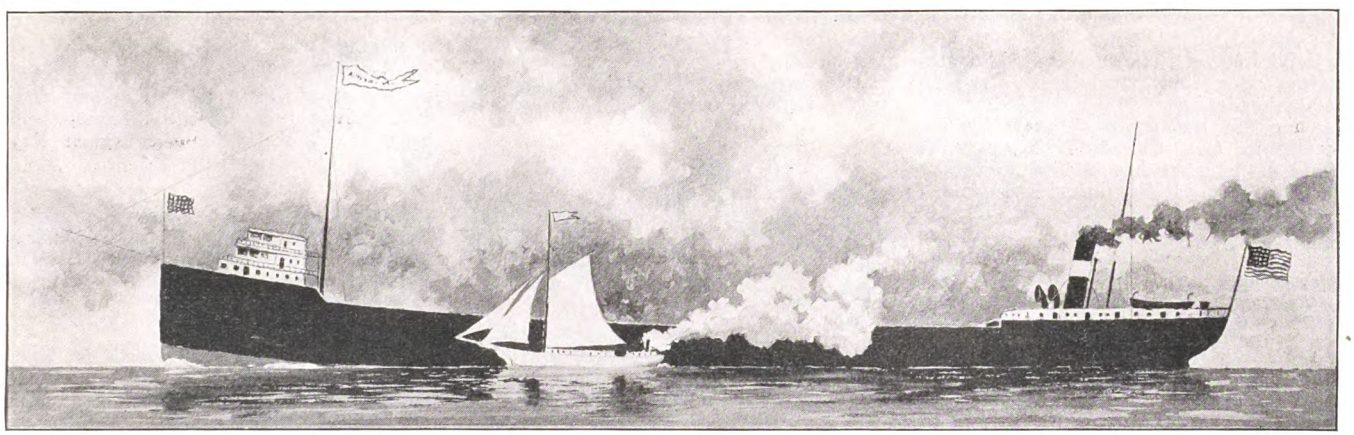
Rear Admiral Capps made his first address, an appeal to the patriotism of the lumbermen, in which he said that the United States was in the war far more seriously than the vast majority of our people realize.

"Mr. Hurley and I are nothing in the world but two units in this scheme. If we are able to achieve any results at all, we have got to achieve them through your earnest co-operation and assistance. No half-hearted measures will do.

"And at the very beginning, contracts were made for certain kinds of tonnage. A very large number of contracts have been let for wooden tonnage. The merits of wood or steel have nothing whatever to do with the case. The output of both classes is vitally important to the situation. Many of you gentlemen undertook certain obligations, the difficulty of which I may not fully understand, and with which you may be more conversant.

"But all difficulties must be disposed of. You doubtless have the power. We count on your co-operation absolutely and you will come forward and give it, I am quite sure, because I have yet to find the great American thinking public slow in coming forward to do its duty when it thoroughly understands the situation. You are just as much laborers in the vineyard as we are. It may be that your financial returns may not be as you thought they would be in the beginning.

"It may be that other people are getting contracts for other work under more favorable conditions. That is neither here nor there. You have to come forward and deliver the goods, and I feel sure that you gentlemen will make known your real difficulties, and if we can help to solve them we will do it. But we ask, we expect, and we know we are going to get co-operation, because this work is not for you, not for us, not for the President even, but for the nation, and we must look at it that way absolutely and get in the same boat and paddle in the same direction."



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FIRST GREAT LAKES PROPELLER, VANDALIA, 1841, AND HER MODERN SUCCESSOR

The package freight lighter ADELE, of the Great Lakes Transit Corp., will be transferred to New York harbor, where she will be stationed.

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On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Mid-Season News of the Great Lakes

By M. C. Lynch

THE Kelly-Atkinson Construction Co., Chicago, has contracted with the United States shipping board to erect 20 cargo-carrying vessels for the government by December, 1918. The contract price is $9,000,000. Each vessel will have a tonnage of 3500 and is to be of composite type, that is, partly of steel and partly of wood. The Kelly-Atkinson Co. has been in the steel construction business for more than 25 years, but never before has constructed ships.

* * *

Judge Hazel, in the United States district court, July 27, handed down an opinion ordering a division of costs and damages in the action of the Jenkins Steamship Co., Cleveland, against the Hand & Johnson tug line, Buffalo, for $20,000 damages for injuries sustained by the steamer F. B. SQUIRE on May 23, 1916, when she collided with the dock near the winding basin, Buffalo. The owners of the boat declared that after unloading her cargo at the concrete elevator, the SQUIRE was being towed to the basin by the tugs HARVARD and TOLEDO and that the tugs gave her too much stern way, that they maneuvered her improperly and failed to keep her under control. The tug owners claimed that the steamer did not have the proper lookout and that she failed to respond to the signals given her by the tugs. Judge Hazel ruled that they were both at fault.

* * *

Tank boats to be used as oil fuel stations is the new idea which a New York company is about to try out. R. L. Francis, Chicago, who is representing the New York oil company backing the project, was in Buffalo recently looking after a fleet of six canal boats just purchased for this purpose. They are to be converted into tank boats, and will be used as oil fuel stations at various places along the lakes and at some ocean ports. Mr. Francis, in discussing the new venture, said that each boat was to be an oiling station to supply yachts, motor boats and any other craft using oil and desiring to fuel en route.

* * *

The tug JESSIE HALL recently went ashore near Silver island and filled with water. A wrecking outfit was sent to the stranded boat from Port Arthur.

* * *

The steamers SACHEM and MITCHELL collided in the Detroit river, Tuesday, July 24.

* * *

The United States government has purchased the steamer RACINE from the Chicago, Racine & Milwaukee line. The price paid is said to be in excess of $250,000. The RACINE has been in the excursion business for the local line and also had a regular run between Chicago and Milwaukee. The steamer ILLINOIS will replace the RACINE on the Chicago run.

* * *

A new electrically operated coal-handling bridge is to be built by the Great Lakes Coal & Dock Co., Duluth and Superior, at its dock on St. Louis bay, at the head of the lakes. The work is in charge of the Mead-Morrison Co. Much of the material will come from Milwaukee, where the company purchased a dismantled railroad bridge recently replaced with a new draw-span.

* * *

It was necessary to cut off part of the masts of the steamer NORTH SEA, which was carrying a cargo of flax seed consigned to Sherwin Williams Co., Cleveland, because the boat was unable to pass under the new Cleveland viaduct.

* * *

Bids for the wrecked steamer NATIRONCO were opened at the office of R. Parry-Jones, July 27. The bidding was pretty keen, bids on the first day ranging from $25,000 to $32,000. The $32,000 bid was offered by A. B. Mackay, Hamilton, Ont., former owner of the boat, acting for French interests.

* * *

The steamer BRAZIL at the Ohio Central docks, Toledo, was attached, Monday, July 23, in a damage suit. Carl Anderson, former fireman on the boat, says he was injured because of defective machinery, and has filed suit for $20,000 damages from the Great Lakes Transportation Co., owner of the BRAZIL.

* * *

The steamer J. M. SCHOONMAKER and the barge 137 collided in Duluth harbor, Monday, July 23. The barge suffered three broken frames and a number of dented plates. The SCHOONMAKER, which was outbound with ore, did not report any damage, and continued on her way to Lake Erie.

* * *

The steamer KIOWA cleared for Montreal July 21. She went to New York from that port, to be used in salt water service. She was built at the Cleveland yard of the American Shipbuilding Co.

* * *

The body of William E. Lloyd, Buffalo agent for the Great Lakes Transit Corp., who has been missing since last March 17, when his automobile plunged into the Erie canal, was recovered from the canal at Black Rock early on the morning of July 18. Mr. Lloyd was for years superintendent of the Mutual Transit Co. at Buffalo, and when that company was taken over by the Great Lakes Transit Corp., he was made Buffalo agent of the new line. He was for a time a member of the board of directors of the Lake Carriers' association and very popular among the members of that organization. He was 43 years old and is survived by his father and mother, who live at Tioga, and a widow and one son, about 14 years old, living at Buffalo.

* * *

A floating dry dock purchased by the Toronto Dry Dock Co., Toronto, Ont., at a cost of between $50,000 and $60,000, arrived there recently, having been towed to Toronto from Sturgeon Bay, Wis., in three sections.

* * *

The steamer WAR CHANT was launched at the Superior yard of the American Shipbuilding Co., at noon, Aug. 11. The vessel is building for the Cunard interests for salt water service.

* * *

A new ore storage yard is being built at Cranesville, 10 miles south of Conneaut, O. The timbers are from an old ore dock at Duluth, which has been replaced by concrete, and are being brought down on the decks of ore carriers.

* * *

The Edward Gillen Co. has started work at Ashtabula on the construction of the new steel pierhead for the local breakwater to replace the one sunk last year while being placed in position. C. F. Gersman, United States engineer inspector, is in charge of the work.

* * *

Grain receipts fell off at Buffalo during the month of July, the result principally of the short crop of 1916 and consequent scarcity of grain at the head of the lakes. Up to July 31, the receipts at the Buffalo elevators totaled 77,463,222 bushels against 89,163,858 bushels up to that date last year, a decrease for this season of 11,700,636 bushels. During the month of July, 1917, the receipts at Buffalo elevators were 10,170,093 bushels as against 23,276,859 bushels in July, 1916. This shows a falling off of 13,106,766 bushels in July, 1917.

* * *

The tug ANNIE SMITH and the barge CHINOOK, owned by the United Fuel & Supply Co., Detroit, collided about 12:30 o'clock Monday morning, July 30, with the steamer PERSEUS in the St. Clair Flats canal, about one and one-quarter miles below the lower entrance of the canal. The steamer PERSEUS was only slightly damaged, but both the tug and the barge were sent to the bottom. The

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tug is in about 16 feet of water, and the barge is in the channel in about 20 feet with her stern above the surface. Both are being lighted at night. The CHINOOK was struck on her starboard side amidship after the steamer had collided with the tug. Crews of both vessels escaped in yawl boats.

* * *

The new M. A. Hanna & Co. freighter being built in the Lorain yards of the American Shipbuilding Co. will be launched Saturday, Aug. 18. The boat was christened CARMI A. THOMPSON, in honor of the former secretary of state of Ohio.

* * *

W. M. O'Connor, who was ticket agent for the Great Lakes Transit Corp., at Duluth, has resigned this position to take an appointment in the commissary department of the United States army in New York City. Mr. O'Connor is the son of Capt. T. V. O'Connor, Buffalo, president of the International Longshoremen's association. He was for a time employed as clerk in the freight department of the Great Lakes Transit Corp. in Buffalo, but was later transferred to Duluth.

* * *

The Ohio Shipbuilding Co., Cleveland, capital stock $75,000, was incorporated at Columbus, Monday, July 30. An option has been taken on some river front property in the upper harbor, where a shipbuilding plant for turning out wooden vessels will be located if present plans work out. The new company expects to bid for at least two of the wooden steamers planned by the shipping board for salt water service. If these contracts are secured work on the new plant will start at once.

* * *

Capt. Charles B. Galton brought a record cargo of ore to the Rogers-Brown plant at Buffalo, on July 30, in the steamer FRANK H. GOODYEAR, managed by Capt. John Mitchell, Cleveland. She had on 12,300 tons from Duluth, the biggest ore cargo ever brought to the port of Buffalo. On July 9, the GOODYEAR brought down 12,036 tons, the record for Buffalo up to that time.

* * *

The steamer J. H. G. HAGARTY struck while going into Port Colborne early in the week of July 16 and damaged a few plates. She was repaired at the Buffalo drydock.

* * *

The Marine Elevator Co. has just purchased 1145 feet of frontage on the Buffalo river opposite the Buffalo furnaces, which gives it a total ground space of 400,750 square feet. It is reported that the company is contemplating the erection of a new elevator of 1,000,000-bushel capacity, the work to be begun in the near future. It is estimated that the elevator will cost approximately $1,000,000. Such an elevator would increase the capacity of the port of Buffalo about 25,000,000 bushels a year. In addition to the elevator the company will build either a flour mill or a warehouse. If the latter, they will have the facilities both for unloading boats and loading trains.

* * *

The steamer EASTON, formerly owned by the A. Booth Co., has been sold to James Ellswell & Co., New York. The EASTON has traded between Duluth and the north shore in the passenger and freight business for a number of years.

Around the Gulf

By H. H. Dunn

THE Inland Navigation Co., which has been operating self-propelled steel barges carrying general cargo between New Orleans, St. Louis and way stations along the Mississippi for more than a year, will put on three large new barges about Aug. 15, especially to handle lumber and relieve the southern car shortage, according to N. F. Knight, commercial agent of the company in New Orleans. These barges will give 10-day service between New Orleans and St. Louis, and smaller barges will be carried as tow by the motor barges. The barge now in service, INCO No. 1, carried 25 carloads of dressed lumber, most of it for the federal government, from New Orleans to St. Louis on its last trip in July. This lumber moved at the full rail rate of 19 cents per 100 pounds. Return cargoes offered by Cairo, St. Louis and Memphis, according to Mr. Knight, are sufficient to keep the barges comfortably filled on their runs down the river, while lumber for the upstream trips has been offered to the Inland company at the rate of 1,000,000 feet a day for weeks to come.

* * *

The Southwest Louisiana Waterways association executive committee has named a special committee to perfect legal organization so the association may take charge of all inland waterway development and improvement in the southwestern part of Louisiana. Another committee has been named to collect half the funds necessary for the construction of locks and dams on the Mermentau river to prevent the ingress of salt water from the gulf, the federal government having agreed to furnish the other half. A third committee has been named to obtain a complete report on conditions on the Mermentau, development of which is held to be necessary to the growth of Crowley and other southwestern towns, and to present this data to the government. Indications are that the money will be raised and the improvement, which means a great deal to the development of this part of Louisiana, will be under way in a few months.

* * *

The GERTRUDE A. SOMERVILLE, the largest ship ever launched in Mississippi, went into the water at Gulfport, Miss., July 26. She is a three-masted auxiliary schooner of 725 tons net, 176 feet long, 35 feet 1 inch beam, 14 feet 3 inches deep in the hold, and will draw 17 feet of water loaded. She was built on plans approved by the American bureau of shipping, and will be in command of Captain William Rickert. The launching was private and closely guarded.

* * *

The International Shipbuilding Co., Gulfport, Miss., has announced it will build a fleet of some 20 oyster and shrimp schooners at its yards in Pascagoula, Miss., for sea-food packers of Gulfport, Biloxi and Pass Christian.

* * *

What is believed to have been an incendiary fire broke out in the $250,000 floating dry dock of the New Orleans Dry Dock Co., in Algiers, at 1 a. m., July 27. The British merchant steamer SIZERGH CASTLE, was in the dock, and for a time it seemed that both dock and ship would be destroyed, but the fire tug SAMSON, belonging to the board of port commissioners, finally extinguished the blaze, with damage of more than $3000. The flames started in the engine room of the dry dock.

* * *

More Mississippi valley towns are taking active interest in the efforts of the Valley Traffic Association to establish barge lines on the river between Minneapolis and New Orleans. Additional requests for the services of Walter Parker, special agent of the inland waterways bureau of the department of commerce, have been received from Davenport, Rock Island, Kansas City, Mo., Cincinnati and Muskogee, all of which cities have expressed, through their chambers of commerce, their intention to aid in the revival of boat traffic on the Mississippi. Mr. Parker now is spreading the barge line propaganda up and down the valley.

* * *

The Murnam Shipbuilding Co., Mobile, Ala., announces it has closed contracts to build four wooden ships for the government.

* * *

Captain Charles W. Drown, one of the oldest river captains in Louisiana, died in New Orleans July 25, as the result of injuries sustained some two years ago. Captain Drown was born in Alexandria and was a quartermaster's clerk at Mansfield, La., during the Civil war, being too young to enlist. Following the war he entered the service of the old Red River line and rapidly rose to be manager of the company whose packets plied thickly between New Orleans, Shreveport and a dozen other river towns. When the railroads drove this line out of business, Captain Drown bought several of the boats and maintained a profitable steamer service for a number of years on the Mississippi and Red rivers.

* * *

The sinking of the New Orleans bark HILDEGARDE by a bomb from a submarine in European waters late in July recalls that this was the most noted "hoodoo ship" to sail from the Crescent City in a decade. About a year ago, the HILDEGARDE bumped against a rock off Norfolk, and, though no lives were lost, the accident cost her owners nearly all the profits of the voyage in repairs. A few days after the bark went to sea again, she found another rock off Savannah. Repaired from this accident, she got as far south as Miami, Fla., and ran herself onto a third rock, this time so hard that for a time it appeared she could not be pulled off. Alfred Clement & Co., New Orleans, operated the bark.

* * *

The Biloxi Shipyard & Box Factory Co., Biloxi, Miss., will build two 3500-ton wooden steamers for the Emergency Fleet Corp., according to Francis Brander, manager of the company. The steamers will cost about $360,000 each

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and will be completed in about six months; 250 men are working at the plant at Biloxi.

* * *

The Union Bridge & Construction Co., which has contracts for six wooden vessels for the shipping board, has completed its plant at Morgan City, La., and work has begun on one of the boats.

* * *

The Universal Shipbuilding Co., Houston, Tex., announces it has closed contracts with the United States Emergency Fleet Corp. for the construction of 12 wooden steamers.

* * *

The Pan-American Trading Co. has purchased 3500 acres along Buffalo Bayou, near Houston, Tex., and has begun work on a shipyard for the construction of its own ships. The ways and shops for this yard are to be built over the water and contracts have been let by the company for cutting 1000 piles from its own land along the bayou.

Boston Bay Notes

By George S. Hudson

BOSTON repair firms have figured largely in making ready for sea the German liners seized at that port. Among these concerns are the Atlantic Works; Bertlesen & Petersen, of East Boston and the Boston Engineering Co., Boston. Although the ships were badly damaged by wholesale acts of vandalism, the Boston firms have succeeded in making the ships seaworthy and have turned them over to the government well within the time specified in the contracts. This work was accomplished by employing largely augmented gangs of machinists and other artisans. The Atlantic Works at one time had 350 men on its pay roll and the majority of the men were engaged on the KRONPRINZESSIN CECILIE, otherwise known as the "treasure" ship that sought refuge at Bar Harbor, Me., when turned back on declaration of war while bound from New York for Bremen. The Boston Engineering Co. had the contract on OCKENFELS, while KOLN was repaired by Bertlesen & Petersen. In addition, these concerns and others worked on the AMERIKA, CINCINNATI, WITTEKIND and Austrian freighter ERNY.

* * *

The steamer COASTWISE has been delayed by a new ruling which made it imperative to replace eight Germans in the crew by men not classed as alien enemies. The Germans had been on the ship two years, laterly by a special permit which placed the Coastwise Transportation Co. in a position of responsibility.

* * *

The whaling bark ANDREW HICKS, built 50 years ago at Fairhaven, Mass., has been sold to foreign account and will be placed in oversea trade.

* * *

A petition asking that pier heads at the Boston navy yard be extended 240 feet has been referred to the war department. Objection has been heard as the lengthening of piers will obstruct the upper harbor at its narrowest part and hamper movements of shipping to and from Mystic wharf.

* * *

Ernest W. Lesser, for 24 years dock superintendent for Patterson, Wylde & Co., Boston, shipping agents, is dead at the age of 72. Mr. Lesser was born in Germany.

* * *

Coasting vessels between ports in Nova Scotia and Boston are earning high rates on lumber cargoes, the present rate from Shulee being $8 per 1000 feet as compared with $2 before the war. Lumber rates from this country to River Plate are very high, a ship having been chartered at $63 per 1000. Rates on lumber between Gulf ports and ports in Florida and South Carolina and Boston go as high as $30 per 111.

* * *

John J. Martin, Boston, has purchased the three-masted schooner PALATKA of Morey & Co., New York, and changed the name to BILLIE MARTIN. The PALATKA was built in Jacksonville, Fla., and is to be used in the coastwise trade.

* * *

The three-masted Boston schooner WILLIAM M. CRITCHETT is a total loss on Bird Rock, near the Bahamas, while bound from Philadelphia to Banes, Cuba, with a cargo of coal. The CRITCHETT, owned by Rogers & Webb, was commanded by Capt. J. D. Sproul whose former schooner, AUGUSTUS WELT, was recently destroyed by a German submarine.

* * *

The steamer CAPE ANN has been sold by the Boston & Gloucester Steamship Co. to J. W. Elwell & Co., New York, and will be placed in general coasting trade. The CAPE ANN was employed for years as an excursion craft and registered 719 gross tons. Price paid was in the vicinity of $200,000

Pacific Coast Gossip

By R. C. Hill

Submarine chaser No. 288, the first built at the Puget sound navy yard, was launched recently. The christening ceremony was performed on the seawall after which a floating crane picked the little craft up and gently deposited it in the water.

* * *

After lying at the bottom of Kake harbor, Alaska, the freighter NORTHLAND has been salvaged after many difficulties and is at Seattle for repairs. The vessel sank at the wharf in deep water and several attempts at floating were unsuccessful. The NORTHLAND was brought to the surface but little damaged. In the meantime the value of the hull has more than doubled. She will be refitted for the Alaska trade.

* * *

The first of the 8800-ton Cunard liners completed at a Pacific yard, the British steamer WAR BARON, has loaded on Puget sound and departed for an unannounced port. The WAR BARON was built at Portland by the Northwest Steel Works. She underwent satisfactory trials on Puget sound. Another Cunard liner, the VICEROY, was launched at the Northwest Steel Works recently.

* * *

Having completed a successful voyage to the Orient, the Norwegian steamship GOLDEN GATE, constructed by the Seattle Construction & Dry Dock Co., has left Seattle on her second run to the far east. The GOLDEN GATE was 69 days on her first voyage, during which calls were made at several ports in China and Japan.

* * *

The plant of the Todd Shipbuilding Corp. is rapidly being completed at Tacoma, where the third section of an immense floating drydock is now in place. The dock has been built in sections. Each part is 126 feet in length with a 90-foot beam. The third section was launched at Port Blakely last month and the fourth unit will be completed within a few weeks.

* * *

The largest wooden vessel ever built on Puget sound was launched recently at the Ward shipyards, Olympia. This vessel was christened WERGELAND and was built for Norwegian owners. The WERGELAND is a 5-masted craft, 290 feet long, beam of 48 feet, and depth of hold 30 feet. She will have two internal combustion engines of 350 horsepower each and has capacity for 2,000,000 feet of lumber. The new vessel is already chartered for a voyage to Australia.

* * *

Seattle's water borne commerce registered some remarkable gains during the first six months of 1917 as compared with the same period in the previous year. While the trade to Vladivostok, which reached its peak in 1916, has fallen off due to the diversion of this business through British Columbia, this port has made enormous gains in other routes, the net gain being approximately $46,000,000. The exports to Vladivostok amounted to $7,000,000 during the first half of this year. The following trades out of Seattle show increases during the last six months: China and Japan, $54,000,000; British Columbia, $14,000,000; East Indies, $4,700,000; India, $2,800,000; South America, $350,000.

* * *

Owing to war conditions and lack of tonnage, Puget sound has been without direct steamship service to the Hawaiian islands for the past year and a rapidly developing trade has been greatly handicapped. However, the Pacific Steamship Co. will dispatch the steamer SENATOR from Seattle to Honolulu. It is likely that this service will be continued, as there is a constant and insistent demand for space to the islands.

* * *

Additional contracts for ships have been awarded yards on the Columbia river. The Foundation Co., New York, will construct for the French government 20 wooden ships at Portland, where 10 ways and a large yard will be installed. The Columbia River Shipbuilding Co. will build a number of steel steamers for the French government, delivery of the first to be made July 1, 1918.

* * *

J. F. Duthie & Co., Seattle, have recently received an order for two vessels for the French government. The yard already had 10 contracts for British and Norwegian owners.

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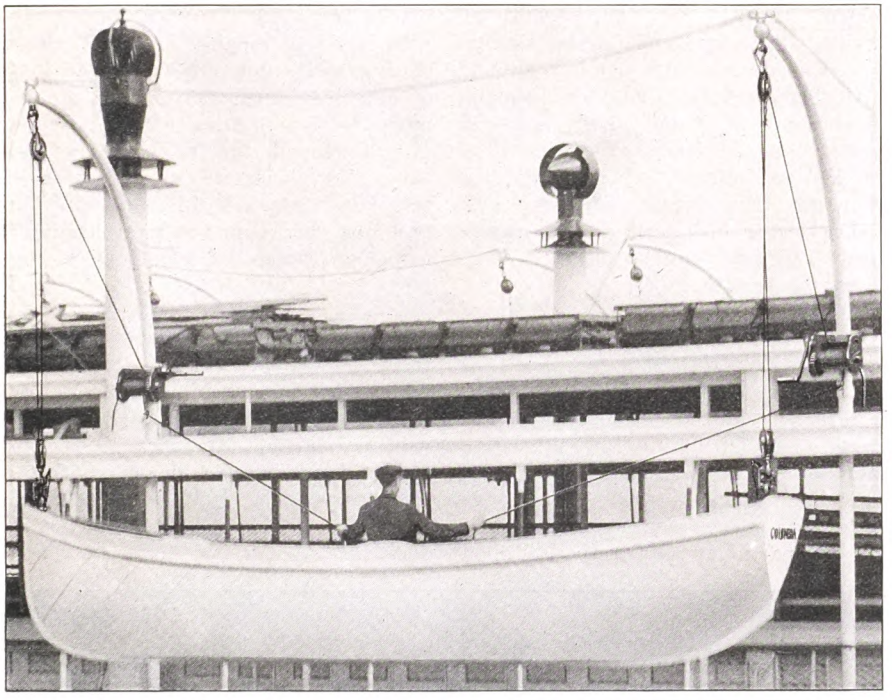
Equipment Used Afloat and Ashore

Life Boat Gear—Large Marine Boilers—Rivet Cutter

THE Eckliff Circulator Co., Detroit, has developed a line of davit winches and releasing hooks for life boats, which contains many features of interest. Events of three years of war have sharply focused attention on the necessity for improving on the conventional method of launching life boats from a vessel in distress. In getting life boats away, speed is the essential factor. Safety is scarcely less important, but without speed there can be no assurance of safety. To insure speed, apparatus used in handling life boats should be sure, simple and easily manipulated. It is also desirable to provide for the release of the boat at both ends simultaneously.



LOWERING A BOAT UNDER COMPLETE CONTROL

In designing the Eckliff boat-handling apparatus, an effort has been made to fulfill all of these conditions. The apparatus includes special winches which may be controlled by a single line, together with releasing hooks that are said to be positive in action. It is claimed that with this apparatus, the details of which are shown in the accompanying illustrations, two men can swing out and lower a 26-person life boat 38 feet to the water in 20 seconds. The releasing hook, it is pointed out, is not affected by freezing weather.

The lowering device has recently been improved and at the present time only one windlass is necessary. This windlass is securely bolted to the deck instead of being attached to the davits. It also is arranged so that it can be easily controlled by one man sitting in the boat. In addition to life boats, the Eckliff Circulator Co. manufactures boiler circulators, a large number of which have been installed on the Great Lakes and both the Atlantic and Pacific coasts.

The Seattle Construction & Dry Dock Co., Seattle, is publishing an interesting newspaper for the benefit of its employes, entitled *The Rivet*. The paper is edited by C. Bowman, one of the employes of the Seattle Construction & Dry Dock Co. It is attractively arranged and full of items of interest to every one connected with the large plant operated by the Seattle company.

The corporate name of the Eckliff Automatic Boiler Circulator Co., Detroit, has been changed to the Eckliff Circulator Co.

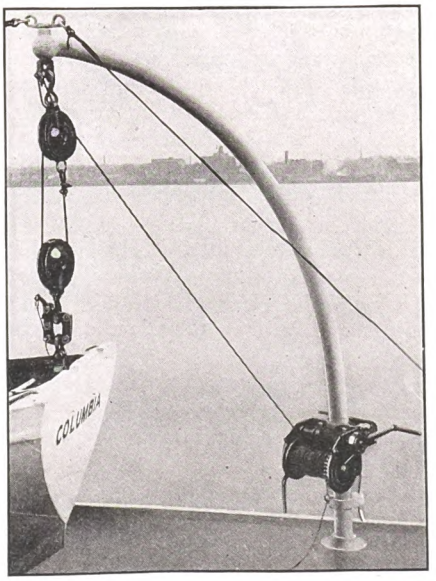
The Marine Boiler Works, Toledo, has been acquired by the Toledo Shipbuilding Co. It will be operated as part of the Toledo company's extensive plant.

C. C. Galbraith & Son, steamship and ship yard supplies, have moved from the Columbia building, and are now located in larger quarters, at 47-49 West street, New York. The office and storehouse are now under one cover.

EFFECT OF RELEASING BOAT FULLY LOADED SEVERAL FEET ABOVE WATER

Thomas Spacing Table

The Standard Bridge Tool Co., Fulton building, Pittsburgh, which for the past 10 years has been specializing on the building of the Thomas spacing table, has been incorporated under a Pennsylvania charter and the name of the company has been changed to The Thomas Spacing Ma-



ECKLIFF SAFETY DAVIT WINCH AND RELEASING HOOK

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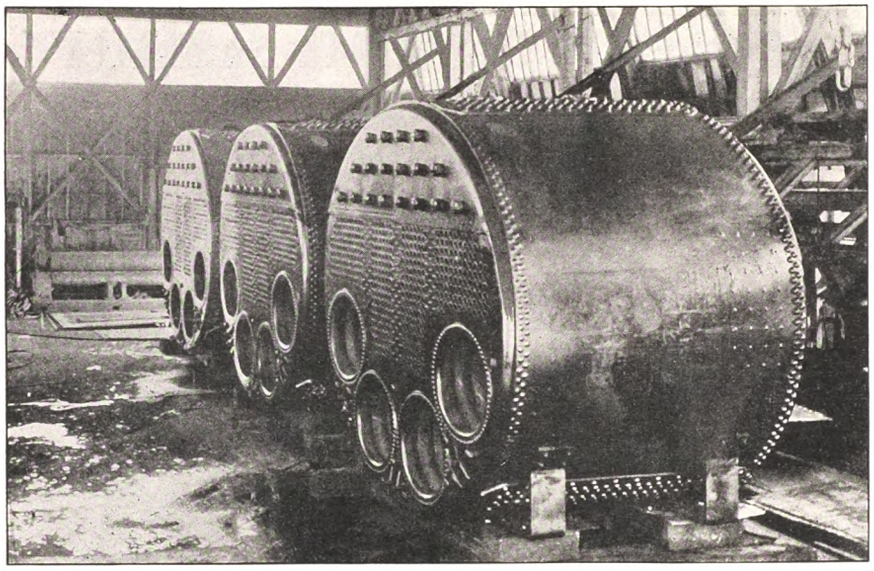

MARINE BOILERS BUILT AT SEATTLE

chine Co. The total capitalization will be $320,000.

The company has purchased a site of 19 acres at Glenshaw, Pa., near Pittsburgh on the main line of the Baltimore & Ohio railroad on which a modern fireproof machine shop is under construction. The equipment for the new shop has been purchased and most of it delivered.

The directors of the company include George P. Thomas, Howard Zacharias, J. S. M. Phillips, Julian Burdick and C. H. Stoer. The main office will remain in the Fulton building, Pittsburgh.

Large Marine Boilers

The accompanying illustration shows a part of an order for a large number of Scotch marine boilers recently executed by the Commercial Boiler Works, Seattle, for a San Francisco customer. These boilers, which are of the standard type, are 16 feet in diameter and 11 feet 6 inches long. They are rated at 1100 horsepower each and are designed to carry 200 pounds steam pressure. Each boiler is fitted with four furnaces of the Morrison corrugated type. There are no girth seams in the shells. The Commercial Boiler Works operates one of the largest marine boiler building plants in the Pacific northwest. The plant is located on the East Waterway at Seattle. Dockage facilities are provided which permit the largest steamships to put in for repairs.

Capt. W. W. Dawley, master of the steamer J. E. Upson, of the Wilson Transit Co., was stricken with paralysis on Lake Erie, Aug. 6. The steamer left Ashtabula at 10 o'clock bound for the head of Lake Superior and Captain Dawley was stricken shortly after she passed Fairport. The mate brought the Upson to Cleveland and Captain Dawley was removed to the hospital, where he died Tuesday, Aug. 7. The captain, who was one of the most successful masters on the lakes, sailed boats of the Wilson Transit Co. for more than 25 years. His widow, who was with him when he died, and a son, survive him. The body will be taken to Conneaut for burial.

Manufactures Rivets

Anthony Carlin, Cleveland, manufacturer of ship, boiler and structural rivets, is distributing an attractive catalog descriptive of his products. The line includes rivets in a wide variety of shapes and sizes, many of which are illustrated and described in detail. These rivets, it is pointed out, are made from steel which meets the specifications of the American Boiler Manufacturers' association. The catalog also contains a complete stock list.

Rivet Cutter

A special tool for cutting rivets has been developed by the Rivet Cutting Gun Co., Cincinnati. This apparatus, the details of which are shown in the accompanying illustration, operates on the principle of the pneumatic riveting hammer. It uses compressed air at ordinary shop pressures. It is so constructed that the rivet is dealt a series of sharp, energetic blows, which are so vigorous that the head is soon severed from the shank. Special cutting bits are provided for various kinds of work and the gun is so devised, it is said, that very awkward places may be reached.

In making repairs on steel ships, cutting rivets constitutes a large item of expense. Ordinarily, rivets are removed with a cutting bar and sledge. It is claimed the rivet-cutting gun saves three-quarters of the cost of removing rivets by this method. The gun not only cuts the rivet head off, but also backs the rivet out of the hole.

Rolf Seeberg, a ship chandler, Mobile, Ala., has obtained control of 750 acres on Dog river, near Mobile, for a Norwegian shipbuilding syndicate. The price paid is said by Mr. Seeberg to have been $21,500, and he announces that a shipyard will be built immediately on the property, for constructing wooden vessels.

SPECIAL RIVET CUTTING TOOL

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